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ACTION for health

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Content Analysis of Selected Health Information Websites

Final Report

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ABSTRACT

There are thousands of web sites geared toward the delivery of health information to the general population, each serving a variety of interests. Governments, non-profit organizations and private/commercial actors (i.e. producers of information) have taken advantage of the Internet to communicate with large numbers of people, and have established web sites offering a variety of health-related information. However, no study has been conducted detailing who is supplying what information, for what purpose, and for whom. This exploratory study seeks to shed some light in this area and gain a better understanding of what information the various producers provide, and the inclusiveness of this information. In addition, the research explores how health information web sites are established, developed, and maintained. A research tool was developed to systematically analyse and compare the content of seven health information web sites. The sample included five government-sponsored health information web sites from Canada, the United Kingdom, and Australia, a non-profit web site, and one commercial web site. To complement the web-based data, semi-structured interviews were conducted with professionals associated with four out of the seven web sites. Ideally, the research findings will contribute to the understanding of the issues and challenges related to the computerisation of the health care system, particularly regarding the inclusiveness of Internet-based health information. In addition, recommendations were developed in order to assist producers of information with the development of accessible web-based health information, reflecting a diverse range of health information needs. Suggestions for future research directions conclude the report.

Content Analysis of Selected Health Information Web Sites
Final Report

PREAMBLE TO INTRODUCTION

The Role of Health Promotion

Considering the amount of health information disseminated via the Internet, analyzing the content of health information web sites is an area that warrants the application of health promotion's energy and commitment. Although it is important to look at web sites sponsored by all sectors, governments in particular have a responsibility to ensure that the services they provide are meeting the needs of their constituents. Governments have invested millions of tax dollars into the creation of web sites intended to empower the public to take care of their own health and well-being. However, as the literature review will illustrate, a large segment of the population is unable to access web-based information, thereby calling the effectiveness of a strategy whose benefits are enjoyed by only a portion of the population into question. Health promotion recognizes the vital importance of access to information. "People have to be at the centre of health promotion action, and access to education and information is critical to achieving effective participation and the empowerment of people and communities" (WHO). Content on government web sites should be public information, and should not be within reach of only those who can read at a sophisticated level, have access to the Internet, and have competent technological skills. All people have the right to access this information and have their realities reflected in its content.

The values of health promotion - its positive and holistic view of health, equity, participation, and respect for diversity - and its dedication to challenging the status quo make it an ideal approach to be applied to this project. It recognizes the importance of exploring *why* people are not using a service or a program, and then seeks to eradicate these barriers to participation. The purpose of this study is not to evaluate whether or not the selected health information web sites meet the needs of users, but rather to lay the groundwork for future research projects regarding the computerization of the health care system, and the role of health promotion in the new and ever expanding field of *health informatics*.

INTRODUCTION

Technology and Government

Over the last few years the world has witnessed the evolution of, and increased reliance on, Information and Communication Technology (ICT) (Eng & Gustafason, 1999). ICT's have played an increasingly prominent role in society because of their ability to facilitate involvement in the international market, encourage and support political accountability, and improve the delivery of basic services and local development opportunities (UNDP).

These technologies have appeared to have altered all aspects of Canadian society and there is no evidence to suggest this trend will slow down in the near future. Although they were initially embraced most enthusiastically and extensively by the private sector, information and communications technologies have been adopted by governments in hopes of reaping the benefits of the revolution in information technology. Not surprisingly, the healthcare system, Canada's most heavily funded and closely scrutinized social program, has turned to information and communication technology to facilitate its renewal.

Polls suggest that access to high-quality, publicly funded health care is the number one priority of a large majority of Canadians. In the year 2000, 88% of Canadians strongly supported a national, publicly funded system (Medelson, 2002). However, Medicare is now facing a crisis of public confidence. Fiscal pressures, coupled with increasing demands (e.g. rapidly aging population and increasing cost of medical technology) have produced major changes in the health system, challenging health care providers to deliver quality health care with fewer resources. Consequently, many Canadians are unsatisfied with the current state of the health care system and are looking to their governments for solutions.

In order to facilitate Canada's health care renewal, the federal government has turned to technology. It is widely believed by governments that utilizing communication and information technologies will increase knowledge, improve the quality of care, and allow all Canadians to enjoy better health (Dodge, 2000).

Information Communication Technologies (ICT's) is a phrase encompassing a range of communication mediums, such as telephones, cellular service, faxes, computers, and Internet technology (Baker, 2003). Health Canada considers "information and communication technologies as one of the main keys to ensuring a sustainable, efficient and effective health system in Canada" (Siman, 1999, p. 2). The perceived benefits of technology on the health of Canadians has led the federal government to make a commitment to creating a "seamless, borderless, fully integrated health system, accessible anywhere in Canada, 24-hours a day, 7-days a week, 52-weeks a year." (Dodge, 2000).

Referred to as the "Pan Canadian Health Information Highway", this "Infoway" is designed to unite people, ideas and information through the use of modern communications technologies (Siman, 1999). This Infoway is intended to serve as a helpful tool for policy makers, service providers, and the general public, and improve

everyone's ability to make informed decisions regarding their health and the health care system (F/P/T/ Advisory Committee on Health Infostructre, 2000). Two recent and highly publicized reports*, The Kirby Senate Study on the State of the Health Care System in Canada* and the *Romanow Commission on the Future of Health Care in Canada* reinforce this commitment to connect health care and information technology. Both reports argue that ICT's hold many potential benefits for all stakeholders involved and should be seen as tools of empowerment and accountability.

The release of the 1997 budget signaled the beginning of a new commitment by the federal government to develop a national health information highway. In this year both the Canadian Office of Health and Information Highway (OHIH), and the Advisory Council on Health Infostructure, were established to explore the possible benefits of new technology on the health of Canadians, and to develop guidelines and policies regarding health and technology. In 1999, the Advisory Committee on Health Inforstructure (ACHI) was created. This committee, consisting of representatives from all levels of government, was formed to develop national strategies aimed at enhancing the effectiveness and use of information and its enabling technologies in the health sector. Based on the framework proposed by the Advisory Council in its 1999 report: Canada Health Infoway: Paths for Better Health, ACHI developed a blueprint and tactical plan for a pan-Canadian Health Infostructure, 2000. This blueprint outlines a range of key directions the government could pursue in working towards its goals. ACHI concluded that the Tactical Plan should focus on three broad areas: health information for the public; integrated provider solutions; and, electronic health records. Steps have been taken, by various stakeholders, to progress in these three areas.

The above initiatives represent just a sample of what the federal government and their partners have been doing to make the Infoway a reality. This study will concentrate on only one section of the Tactical Plan: health information for the public. More specifically, this study will focus on the dissemination of health information via the Internet, by governments, both federal and provincial, and other producers of information, namely non-profit and commercial actors.

Recent Trends: Health Information and the Internet

Since the 1960's the general public has been encouraged to actively participate in the preservation of their health (National Academy of Sciences, 2000). Fiscal pressures, coupled with increasing demands (e.g. rapidly aging population and increasing cost of medical technology) have produced major changes in the health system, challenging health care providers to deliver quality health care with fewer resources. An environment with fewer resources prefers patients who are well informed and self-sufficient (National Academy of Sciences, 2000). The Internet has the potential to be an effective tool to help individuals find the information they need, helping them to participate in the maintenance of their health and well-being.

In 2000, approximately 51 per cent of Canadians were using the Internet, up from approximately 42 per cent in 1999 (Statistics Canada, 2001, July 26). This increase in access has made the Internet an attractive medium for both public and private actors to disseminate health information to Canadians. According to Statistics Canada, almost half of all Internet users search the World Wide Web for health-related information (Dryburgh, 2001). There are thousands of web sites geared toward the delivery of

health information to the general population, each serving a variety of interests. Governments, non-profit organizations and private/commercial actors have taken advantage of the Internet to communicate with large numbers of people, and have established web sites offering a variety of health-related information.

In 2001 Statistics Canada conducted a study to determine why and how Canadians use the Internet. This study revealed that 48% of Canadians have used the Internet to find health-related information (Dryburgh, 2001). Of this group, 36% of Internet users who search for health and medical information consult Health Canada's web site, 16% search other government web sites, 32% visit commercial or private web sites, and 25% search professional health association web sites and other non-profit health sites (Dryburgh, 2001).

All three sectors – government, non-profit, and commercial –use the Internet as a means to disseminate health information and promote their vision of "health". However, the term *health* is subjective. Consequently, web sites disseminating health information vary considerably depending on their authors' definition of health. However, no study has been conducted detailing who is supplying what information, for what purpose, and for whom. The purpose of this inquiry is to shed some light in this area and gain a better understanding of what health information means to the various sources of information (i.e. government, non-profit and commercial).

The researcher was unable to locate any research that had been conducted in the area of content analysis and health information web sites. Therefore, in order to conduct this research a methodology was developed to systematically analyze and compare the content of health information web sites. Specifically, the research focused on the *purpose*, the *audience*, issues related to *quality,* and the *accessibility* of the web sites' content. To complement the analysis of the web sites' content, key informant interviews were conducted with professionals associated with each web site. Through interviews the researcher was able to explore how the selected health information web sites were established, developed, and maintained.

This report begins with a brief overview of the literature, followed by a conceptual framework delineating the concepts and dimensions embedded within the research project. An outline of the methodology, describing both the challenges researchers face when applying content analysis to Internet-based content, and a detailed account of the procedures followed, is provided. The results from the content analysis and key information interviews are presented, followed by a brief discussion highlighting the key findings and points of interest. In addition, recommendations were developed in order to assist producers of information with the development of accessible web-based health information, reflecting a diverse range of health information needs. Suggestions for future research directions conclude the report.

REVIEW OF THE LITERATURE

Producers of Information: Government, Non-Profit and Commercial

There are thousands of web sites geared toward the delivery of health information to the general population, each serving a variety of interests. Governments, non-profit organizations and private/commercial actors have taken advantage of the Internet's ability to communicate with large numbers of people, and have established web sites offering a variety of health-related information. However, a search of the literature revealed an absence of research outlining what kind of health information is offered by which sector. Nevertheless, after looking at various health information web sites sponsored by the three sectors the researcher was able to draw some general conclusions regarding the information presented by each source.

Government

The term *government* includes all three levels of government: municipal, provincial or state, and federal. Government websites tend to be multi-purpose. They tend to focus on prevention and self-care, health information regarding specific diseases and conditions, and details regarding service delivery. For the purposes of the framework presented here, the term government refers to organizations or agencies that are completely funded and run by government bodies and employees.

Non-Profit

A non-profit organization serves the public and is not in service for the purpose of making a profit. Non-profits may include hospitals, universities, professional associations, voluntary agencies, and religious organizations (Community Service Council Newfoundland and Labrador). There are thousands of non-profits offering health information via the Internet. Unlike government web sites, sites sponsored by non-profit agencies tend to be disease/condition or audience specific. (e.g. The Canadian Cancer Society and The Canadian Women's Health Network). For the purposes of the framework presented here, the term non-profit refers to organizations or agencies that provide services or support to the public and are funded by outside donations and government grants.

Commercial

A private company is owned by private investors with the purpose of making a profit. Health information web sites sponsored by private actors tend to offer a variety of information regarding diseases/conditions, lifestyle choices, and products and services. Web sites are considered an advertising tool for private companies, and often serve as a means to sell their products and services. For the purposes of the framework presented here, the term commercial refers to a private company that is operating with the intention of turning a profit.

Communications Channels

The number of health issues competing for the public's attention, coupled with the increase in demand for reliable health information, requires producers of health

messages to be strategic in their methods of dissemination (Office of Disease Prevention and Health Promotion). Message delivery channels have changed dramatically over the years. In addition, channels are more numerous, and tend to focus on meeting the information needs of a specific target audience (National Cancer Institute, 1999). Currently, there are a variety of channels an organization or individual can employ to disseminate their message. For actors who deliver health information three possible categories of communication channels are: Interpersonal Channels; Mass Media Channels; and Interactive Digital Media Channels.

Interpersonal Channels

Physicians, nurses, health care professionals, friends, family, and counsellors are examples of an interpersonal channel (National Cancer Institute, 1999). Because these channels relate health messages personally, the receiver of the information is more likely to trust the messages communicated interpersonally, more so than those transmitted through media sources (National Cancer Institute, 1999). These channels are effective agents of change in regards to an individual's attitude, skills, and behavioural intent. Disseminating health information via personal contact "is the most effective means for teaching, helping, or caring for an individual" (National Cancer Institute, 1999). However, interpersonal channels do have their shortcomings. For example, communicating health information via an interpersonal channel is time consuming, and therefore, likely expensive (e.g. an appointment with a physician is costly).

Mass Media Channels

Radio, television, magazines, direct mail, billboards, newspaper, pamphlets are examples of mass media channels (National Cancer Institute, 1999). Mass media campaigns can be conducted on general topics, such as healthy eating, or they can be directed towards specific diseases/conditions and target groups, such as prostate cancer and men over the age of 50. In particular mass media channels are effective in raising public awareness about a topic, stimulating the intended audience to seek more information on a topic, increasing knowledge, and altering attitudes, with the possibility of leading to behaviour change (National Cancer Institute, 1999). A major strength of mass media channels is their ability to reach a large amount of people in a relatively short period of time.

Interactive Digital Media Channels

Internet web sites, bulletin boards, newsgroups, chat rooms, CD-ROMS, and kiosks are examples of interactive media channels (National Cancer Institute, 1999). Increasingly these channels are being used and developed, and are likely to play a greater role in the future. Interactive digital media channels are popular because of their ability to communicate large amounts of information (e.g. general health information) and interpersonal interaction (e.g. chat rooms). These channels permit "communicators to deliver highly tailored messages to and receive feedback from the intended audience." (National Cancer Institute, 1999, p. 30). However, using interactive digital media is not a panacea. Credibility and access issues are major barriers to the universality of this media. Despite the problems associated with interactive digital media, Internet web sites, one type of interactive digital media, have gained in popularity since their appearance on the world stage.

Health Information Web Sites

Disseminating health information via the Internet is one of many methods to help individuals maintain and improve their health. There are many reasons why individuals access web-based health information. Some surf the Net for information regarding health conditions or illness (either for themselves or for family members and friends). Others do so in search of general health information, or for work or school-related endeavours (Cotton, 2001). Although not without its shortcomings, the Internet has many advantages over other media. There are advantages for both the users of the information and for the actors who produce the information. In terms of users, apparent advantages of the web over other methods of communication include the ability to access a wealth of information, at any time, while maintaining anonymity and privacy (Shephard, 2002). In addition, it offers individuals a variety of perspectives and sources of information regarding an infinite number of topic areas (Cotton, 2001).

For the producers of content the Internet offers many benefits including the ability to reach large numbers of people rapidly, update information easily on a continual basis, tailor information for individual users, be interactive and graphically appealing, and use a variety of mediums to disseminate information (i.e. print, audio, visual) (National Cancer Institute, 1999). In addition, as Cotton (2001) points out, by providing simulations via the Internet, users are able to "virtually" experience the consequences of their choices and behaviour, without affecting their physical health.

The Internet has the potential to be the perfect medium to disseminate health information and promote consumer education; however, it is not without its downfalls. Information found on the Internet is of variable quality. Therefore the potential for harm due to the over-consumption of unreliable health information reduces the effectiveness of the Internet (Benigeri and Pluye, 2003). In addition, Benigeri and Pluye (2003) argue that the most significant barriers preventing people from using web-based information are the difficulties in finding, understanding, and using the information. Finally, lack of access (due to a variety of barriers ranging from lack of physical access to lack of personal technological and literacy skills) to the Internet, and its content, diminishes the effectiveness of this communication medium. The disadvantages of using the Internet as a means to deliver health information will be further explored in the sections discussing *quality* and *accessibility* of web-based health information.

Content-Related Dimensions

One of the objectives of this exploratory study is to construct a framework to systematically analyze and compare the content of health information web sites. Little published research exists to guide this study. Therefore, the dimensions of content selected were chosen in part to fit the research interests of the field supervisors, as well as based on health communications literature.

Accessibility

Although the Internet has the potential to increase individuals' access to information, not all Canadians are enjoying the benefits from this medium. According to Statistics Canada, during the year 2000, approximately 53% of Canadians over the age

of 15 stated that they had used the Internet within the last 12 months (Dryburgh, 2001). This "digital divide" is mediated by a variety of sociodemographic characteristics (Shade, n/d). Income, education, geographic location, gender and age are five of the most powerful factors influencing Internet use (Reddick, Boucher & Manon, 2000; Statistics Canada, 2001, July 26).

Income

Income is the most important factor to influence the likelihood of an individual accessing the Internet (Reddick, Boucher & Manon, 2000; Statistics Canada, 2001, July 26). Internet use is strongly linked to socio-economic status (Pew Internet and American Life Project, 2001). Research findings conclude that Canadians in the highest income group are five times more likely to use the Internet than people in the lowest income group (Statistics Canada, 1999, July 15).

Education

In the year 2000, 79% of those with a university education used the Internet, compared to 13% of users with less than a high school diploma (Statistics Canada, 2001, March 26). Each additional year of a parent's education increases the likelihood of their household having a computer with an Internet connection by 15% (Willms & Corbett, 2003).

Location (rural versus urban setting)

In 2001, 55 per cent of people living in urban areas used the Internet, compared with 45 per cent of people living in rural areas (Statistics Canada, 2001).

Gender

Men are more likely to use the Internet than women, and this gap generally increases with age (Dryburgh, 1999). According to Statistics Canada, in 2001, 50 per cent of women used the Internet, compared with 56 per cent of men. However, women were more likely than men to consult the Internet for health information. (Dryburgh, 1999).

Age

Age and Internet use is inversely related, as 90% of younger Canadians (15-19) used the Internet in the year 2000, while only 13% of people between 65-69 years of age were Internet users (Statistics Canada, 2001, July 26).

Both the government and private donors recognize that access to a computer with Internet capability is a problem for a large portion of the population, and consequently have taken steps towards providing more computers in public spaces. Libraries, schools and other non-profit organizations have benefited from such initiatives (Benigeri & Pluye, 2003). The Community Access Program (CAP), sponsored by the federal government and administered by Industry Canada, is one example of an initiative the Canadian government has instigated to increase the number of computers (with Internet capability) in public spaces. In addition, there are programs in place designed to

help households acquire a computer with Internet capability. However, providing universal access to the Internet is not the only hurdle that potential users need to overcome. Previous research conducted regarding accessibility and the Internet (Balka & Peterson, 2002; Reddick, Boucher & Manon, 2000) suggests that despite an increase in the number of computers and public Internet facilities, a portion of the Canadian population continue to make little use of this "perceived" resource. This implies that there are other reasons (not previously mentioned), unrelated to physical access (i.e. having the means to acquire a computer), that prevent a portion of the population from accessing web-based information.

Literacy

Literacy is a major barrier preventing thousands of Canadians from accessing computer-based information. Although very few Canadians are unable to read or write anything, a significant portion of the Canadian adult population has limited literacy skills, which affects their ability to participate in society. According to International Adult Literacy Survey (IALS) conducted in 1998 roughly 22 percent of adult Canadians fall into the lowest category of literacy (unable to read or understand written material that they encounter on a daily basis). An additional 26 percent of Canadian adults are at Level 2 (able to read simple material regarding a familiar area or topic) (Perrin, 1998). The majority of health information web sites present medical information riddled with scientific terminology and technical jargon (Benigeri & Pluye, 2003). A study conducted by Berland et al. (2001) suggested that medical web sites often require users to possess high school level or greater reading ability. Considering nearly half of adult Canadians have a low level of literacy this is clearly a problem. Therefore, often the required reading skill to access web-based information is a major barrier for a portion of the Canadian population.

Health Literacy

Health literacy, although related to general literacy, is a distinct form of literacy (Kickbusch, 2001) and is pertinent to the discussion of accessing web-based health information. As defined by Rootman (2003), health literacy is "the knowledge and skills required to respond to information demands of different health contexts". People with a low level of health literacy often face barriers in relation to accessing and understanding health information, thereby limiting their ability to attend to their health needs (AMA Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, 1999). The elderly are particularly prone to having low levels of health literacy (Gazmararian et. al, 1999). Although there are no published Canadian studies regarding levels of health literacy, studies in the United States found low health literacy skills to be common among various patient populations (Rudd et al., 1999). Research suggests that individuals with low levels of literacy tend to report worse health status and use the health care system more than those with proficient levels of literacy (NALD, 2003). Therefore it seems to follow that people with low health literacy do not benefit from advances in web-based health information (Esyebach & Jadad, 2001).

Technological Literacy

Technologies are useful only when they serve the needs of all users (NALD, n/d). However, some segments of the population do not have the necessary technological skills to operate a computer. In order to access web-based information one must

possess the skills to use a computer, conduct an Internet search and locate relevant information. These are not skills that people are born with, but rather develop throughout their lifetime. Technological literacy involves having the skills to effectively make use of technology (Ontario Council for Technology Education). Low technological literacy is a key barrier preventing people from accessing information via the Internet, especially among the senior population (Reddick, & Boucher, 2002).

Usability

Usability is a part of web accessibility. For many people gaining access to web content requires more than having physical access to a computer and the necessary literacy skills. Some individuals rely on assistive technologies such as text readers and voice activated devices to facilitate their use of standard technologies (Treasury Board of Canada Secretariat). Others may be limited by the simplicity of their own technology. However, the age of equipment (i.e. a computer), non-standard operating systems, slow Internet connections, and small screens should not prevent people from obtaining the information they require (Treasury Board of Canada Secretariat). The design of a web site should always reflect the needs of its users. Usability is a combination of factors that affect the user's experience accessing a web site. Usability is a term that encompasses a group of features that change depending on the needs of the target audience and the purpose of the web site (Murray & Costanzo, 1999). For example, a health information web site targeting seniors should ensure that the font size is large enough to allow people with poor eyesight to read the content. Although, there is no agreed upon list of criteria outlining what usability includes, people generally agree that a usable web site is accessible, appealing, consistent, clear, simple, navigable and forgiving of user mistakes (Murray & Costanzo, 1999).

Quality of Information

Millions of people use the Internet as a resource for health information. In 2000, it was estimated that there were 70,000 health-related web sites (Grandinetti, 2000). Research reveals that much of the content on health information web sites is not authored by medical professionals (Eastin, 2001). Due to the nature of the Internet, almost anyone can create a web site and claim to offer expert opinion or advice regarding a host of topics. Some web sites are created by people who are interested in advancing their cause or point of view. Other sites are established by companies interested in selling their products to consumers (Government of British Columbia). As Eastin (2001) points out, much of the content on the Internet is not policed by any governing body or required to adhere to any ethical regulations. Therefore, many Internet sites offer information that is misleading, incorrect, and possibly dangerous.

Increasingly, medical professionals have begun to question the accuracy and credibility of health information offered via the Internet (Wright, 1998). However, due to sheer volume of health information web sites, coupled with the changing nature of web site content, the task of rating and monitoring thousands of web sites is impossible. Moreover as Donald et al., (1998) point out, many documents on the Web "lack basic information about the origin, authorship, or age of the material they provided" (p.1304). Therefore, assessing the quality of web-based health information is a daunting, if not impossible, task for any one agency or organization. As a result it makes sense to encourage users to be responsible for assessing the quality of the information they choose to consult.

In order to help individuals assess the quality of health information, a number of organizations have created specific tools designed to rate and grade content. Others have produced codes of conduct that site providers may voluntarily follow in order to demonstrate to users the quality of their content. (Commission of the European Communities, 2002). Some examples of these self-regulatory initiatives include: Health on the Net Foundation Code (HON code), DISCERN, and TNO Quality Medical Information and Communication (QMIC). The goal of such tools is to help individuals sort through the available information and recognize valid and trustworthy information from information that is riddled with inaccuracies and errors (Commission of the European Communities, 2002).

Several people and organizations have published criteria to evaluate health-related information on the Internet (Kim et al., 1999; Eysenbach et al., 2000; Eysenbach et al., 2002; Winkler et al. 2000; Seidman, Steinwachs, & Rubin, 2003). Kim et al. (1999) conducted a review of published criteria for evaluating health-related information on the Internet to identify areas of consensus. After reviewing the literature they determined that the most frequently cited quality criteria were those surrounding content, design and aesthetics of the site, disclosure of authors, sponsors or developers, currency of information, authority of source, and ease of use (Kim et al., 1999). Content, which included quality, reliability, accuracy, scope, and depth, was the most commonly sited criterion group. Although not as common, other criteria associated with evaluating health information found in the literature include: feedback mechanisms, links, user support, and confidentiality policy.

Eysenbach et al. in 2002 conducted a systematic review of studies that evaluated the quality of health information on the Internet. The review by Eysenbach et al. highlights many of the challenges to evaluating the quality of health information. The key challenged identified by the review related to the fact that there is no consensus regarding how to assess the quality of web-based health information (Eysenbach et al. 2002). Seidman, Steinwachs and Rubin (2003) echoed this observation stating that despite the abundance of guidelines there is no popular method for assessing the quality of health information on the Internet.

Although designing tools to evaluate the quality of web-based information is an important and worthwhile endeavour, the impact of these criteria is minimal considering authors of web sites are under no obligation to adhere to the criteria, as well, users are usually unaware that such criteria exists (Benigeri & Pluye, 2003). Recently, some web sites have started to include a checklist or guidelines regarding how users can assess the quality of health information on a web site. Government-sponsored health-related web sites tend to include information regarding the quality of health information, and, it is likely that this trend will continue to increase as governments rely more on the Internet to deliver health information to populations.

Purpose

The term health is subjective and means different things to different people. Consequently it is not surprising that web sites offering *health information* vary in terms of content, scope, and tone. The purpose(s) of a web site reflects how the authors of the site define health. Sites may have many purposes (i.e. offer a wide array of health information) or they may discuss specific aspects of health. However, it is important to

note that what web sites include, as well as what they omit, illustrates the authors' characterization of health. Possible purposes include: health promotion, health protection, prevention, condition/disease management, social support, health news, health care system, service delivery, complimentary health alternatives, promotions, proper use of medications, evaluation of health information, and tests and procedures.

Audience

In order for a communication initiative to be effective, it must be grounded in the characteristics, needs, and perceptions of the intended audience (Office of Disease Prevention and Health Promotion). Therefore, in order to increase the success of communication projects, program or communications teams should conduct a thorough analysis of the intended audience. Audience analysis helps a communication team gain a better understanding of the behaviours of the intended audience and develop messages that are suitable and appropriate to them (THCU). Analyzing an audience involves the collection, interpretation, and application of demographic, behavioural, and psychographic information (THCU). Once the data has been collected the audience must be segmented into subgroups. Segmentation allows the producers of information to forecast behaviour and tailor programs and messages to meet specific needs (THCU). In addition, segmentation allows producers to identify the best channels for reaching the intended groups, because populations differ in how and where they access health-related information (Office of Disease Prevention and Health Promotion). Deciding who the primary intended audience is and tailoring the communications campaign to their needs and demographics will help ensure the effectiveness of the communications project.

CONCEPTUAL FRAMEWORK

The model in Appendix 1 is a visual representation of this research project. The model includes four possible dimensions of content. These four dimensions - focus, audience, accessibility and quality – have been outlined in detail above. A discussion of how these dimensions are addressed by the "producers" of heath information follows below.

On the left side of the model there is one box representing the various sources of information (i.e. the producers of health information). The term *producers of information* encompass the government, non-profit and the commercial sector. All of these groups sponsor health information web sites for use by the general public. The arrows leading from this box indicates that the producers of information either implicitly or explicitly choose the *purpose* and *audience* of their web sites, and make decisions regarding the accessibility and quality of the information they present.

This model presumes that *purpose*, *audience*, *accessibility*, and *quality* are the four dimensions of content. *Purpose, audience, accessibility* and *quality* are four dimensions of content regardless of the medium through which the information is presented. However, when applying these dimensions to various channels of communication (in this case the Internet) there are channel-specific factors to consider. For example, if an organization is interested in disseminating information regarding heart disease via a web site to the general public, there are different factors to consider (specific to the Internet), than if they chose to relay the information in the form of a pamphlet. Technological literacy and physical access to a computer with internet capability are two examples of channel-specific factors to be considered in this context. The single arrow leading from the content-related dimensions signifies that all four dimensions travel as a group and together comprise the *inclusiveness of health information*. This concept - inclusiveness of health information – reflects who and what (i.e. the topics) is discussed on a health information web site, and whose informational needs are being considered and addressed.

Research Questions

1. In what ways do the selected web sites, sponsored by different producers of information, resemble or differ from one another in terms of - focus, audience, accessibility, and quality – in relation to the inclusiveness of the health information they produce?
2. What is the purpose(s) of the selected health information web sites?
3. Who is the intended audience(s) of the selected health information web sites?
4. To what extent is the content of the selected health information web sites accessible?
5. How do various producers of information assure the quality of the content they include on their web sites?
6. How are health information web sites established, developed and maintained?

PREAMBLE TO METHODOLOGY: CONTENT ANALYSIS

Content analysis systematically applies a set of rules in order to draw conclusions from text (Weber, 1990). As noted by Krippendorff (1980), this research method has four key advantages: it is unobtrusive, it is flexible (i.e. able to be applied to unstructured material), it is context sensitive, and it is able to be applied to large amounts of data. Although this method has been a popular choice for analyzing the content of various media (newspapers, radio spots, television programs and commercials, and political speeches) relatively few have applied it to the Web and its content. After a lengthy review of the literature only a handful of studies were found that apply content analysis to Web sites. In total, eight studies were located by the researcher; however, none of the studies involved analyzing the content of health information web sites. The article entitled, *The Microscope and the Moving Target: The Challenge of Applying Content Analysis to the World Wide Web*, McMillian (2000), was particularly useful to the researcher. In this article, McMillian (2000) reviewed 19, published and unpublished, articles involving content analysis and web sites, and analysed how each study applied the steps of content analysis to the Web. Although none of the studies involved a health-related web site, the insights retrieved from McMillian's analysis reaffirmed conclusions other researchers (who had applied this technique to web-based information) had drawn in other studies involving web-based content analysis.

The lack of research applying content analysis to web sites is partially a result of the complexity of web-based information. Three key areas that seem to cause researchers distress when applying content analysis to the Web include the *definition of a web site*, the *unit of analysis* and the *method of sampling.*

One of the major uncertainties in conducting web content analysis is related to the question what does the term "web site" mean? (McMillian, 2000). It is the understanding of this research team that a web site is a "hierarchy of information, connected via hyperlinks to an infinite number of other sites" (Okazaki & Rivas, 2002, p. 383). Given the boundless nature of web sites, the question remains - where does one web site end and another one begin?

Secondly, as pointed out by Ha & James (1998) Web sites vary in size and the amount of information presented (i.e. content) can range from one page to 50,000 pages (Web Techniques). Considering the volume of information embedded within a web site, it seems impossible to include the entire web site in the analysis. Hence, a portion of the web site (i.e. unit of analysis) must be chosen for review. In addition to size, web sites differ in purpose, structure, and content (Ha & James, 1998). Therefore, selecting a unit of analysis consistent across all samples is highly problematic. The only unit consistent to every web site is a home page. Although some researchers (Ha & James, 1998) view the homepage as an ideal unit of analysis, others insist that some home pages offer relatively little information in comparison to others and often the detail of the information is limited (Okazaki & Rivas, 2002). Nevertheless, as Ha & James (1998) assert "coding an entire web site can be extremely time-consuming and introduces biases based on size" (p.467). Therefore, the question remains, how does one select a unit of analysis that will provide the researcher with "enough" information to draw conclusions regarding the data, without overwhelming the researcher with thousands of pages of web-based information. Obviously selecting the unit of analysis is not an easy task.

Thirdly, as Jones (1999) points out, at present, there is no standardized method of sampling web-based content. However, forming a sample is a critical step in the research process and influences the generalizability the research findings. Krippendorff notes that a sampling plan must "assure that, within the constraints imposed by available knowledge about the phenomena, each unit has the same chance of being represented in the collection of sampling units." (Krippendorff, 1980, 66) However, considering web sites vary significantly in terms of size, content, structure, as well as the revolving nature of web sites (i.e. new web sites are created daily, and others disappear, or the content changes) McMillian suggests that "selecting a true random sample may be next to impossible" (McMillian, 1998, 81).

All three of the above points of contention have yet to be resolved in the literature. Although many of the studies discussed problems associated with, the *unit of analysis*, the *definition of a web site*, and the *sample*, little detail was provided regarding how the researchers reconciled these problems. It appears that researchers recognize that there are inherent difficulties when applying content analysis to web sites; however, few are able to offer any convincing solutions.

METHODOLOGY

The primary goal of this exploratory research inquiry was to develop a methodology to systematically analyze and compare the content of health information web sites, and to assess the inclusiveness of the health information they provide. In addition, the inquiry hoped to explore how health information web sites are established, developed, and maintained. Considering the absence of study in this field, exploratory research was well suited to guide this inquiry, as it enables the investigator to ask questions and pursue new insights for future research (Robson, 2003). It consisted of analyzing the content of selected health information web sites and conducting semi-structured interviews.

Content Analysis of Web Sites

A content analysis of health information web sites was conducted in order to assess their commonalities and differences. The first step in developing a methodology for this inquiry was to decide on the sample. The sample consisted of government, non-profit, and commercial web sites. In total, seven web sites were analyzed. The web sites chosen from the government sector were pre-determined by the field supervisors and were selected to complement their own current research interests. The researcher selected the web sites from the non-profit and commercial sectors. The criteria for inclusion in this study required that the web site be 1) written in English, and, 2) non-topic specific (i.e. offer *general* health information to one or more groups).

Six of the web sites were accessed and coded during a period of three days – February 28 – March 2, 2004. Due to the ever-changing nature of the Web's content it was important to limit the time that the web sites were accessed. However, because of unforeseeable changes, a seventh web site was added to the sample – the Canadian Women's Health Network (CWHN) – and coded on a later date. Initially, the Canadian Health Network (CHN) web site was included in the study as an example of a non-profit web site (as the CHN describes itself to be a non-profit organization on its web site because it is partnered with 26 non-government organizations); however, after further investigation the researcher learned that the CHN is a quasi-governmental web site, receiving 100 per cent of its funding from Health Canada. Therefore, due to the ambiguous nature of the CHN it was decided that a new web site should be chosen to represent the non-profit sector. The CWHN was chosen and coded on March 26, 2004.

Prior to collecting the data, the researcher had to clarify what the term "web site" meant, and define the unit of analysis. For the purposes of this study, the term web site was applied on a general level, defined as "a collection of 'pages' or files linked together and available on the World Wide Web. Web sites are provided by companies, organizations and individuals" (GetNetWise). Any hyperlinks that took the researcher outside of the original web site were not included in the study. It was obvious when a link removed the coder from the original health information web site because the web address would change and often the web site design (i.e. colour scheme and background) were decidedly different.

The unit of analysis was the home page plus *two drill downs.* To *drill down* through content means to move from summary information (e.g. content of the

homepage) to detailed data by focusing in on information. Initially, the researcher attempted to limit the analysis to the home page. However, after further investigation, it was decided that the content available on a home page was too limited and did not necessarily reflect the breadth and scope of content available on a given web site. Therefore, both the home page and all pages within two *drill downs* were subject to analysis (excluding links to other sites).

The content of the web sites was divided into three categories: purpose, audience, and accessibility. These categories were chosen to reflect the field supervisors' research interests and health communication's literature. Prior to collecting the data, a coding template was developed that would include possible content found on health information web sites. This coding template was based on possible features or themes associated with each of the three categories (purpose, audience, and accessibility), a review of the literature, a review of health information web sites within and outside the study sample and discussions with the research team. These coding categories contain sub-categories, as defined in the accompanying coding guidelines (Please see: Appendix 2 for the coding guidelines and coding scheme). The coding template was used to record the content of each web site, within the unit of analysis. It is important to note that as new sub-categories were discovered, the coding book and guidelines were augmented accordingly. The following sub-categories were added to the coding book: medications, evaluation of health information, tests/procedures, consumer participation, gender-based analysis and alternative to text-based information. The categories and sub-categories were dependent upon the following questions:

1. *What is the purpose(s) of the selected health information web sites?*

The researcher was interested in exploring the scope of the information provided by each web site. Initially, the researcher identified 10 sub-categories, and an additional five were included as the tool was applied to the entire sample. In total, 15 sub-categories were outlined in the guidebook, complete with examples of each sub-category in order to ensure clarity.

2. *Who is the intended audience(s) of the selected health information web sites?*

The researcher was interested in learning 1) If there was a direct link to information regarding a group/sub-category and 2) If there was information regarding a group/sub-category, was the information geared towards the group (i.e. were they the intended audience of the information) or was the information provided on the web site *about* the group/sub-category (i.e. the group was the subject of the information). An additional category – not able to discern (N/A) – was included in the tool to account for any limitations imposed by the unit of analysis (i.e. only two drill downs).

The design of the *audience* category was grounded in the assumption that by a web site providing a link on a homepage, to a specific audience or group, the web site's illustrates a commitment to supplying information regarding a particular group. The researcher was interested in learning whether or not the information provided was *for* (audience) or *about* (subject) a specific group, as this explicitly and implicitly demonstrates whose information needs the authors of the web sites are hoping to meet. For example, if there were a link entitled "Aboriginal Peoples" one would assume that

there is information designed for this audience. However, if the information indexed under this category consists of a series of statistics regarding aboriginal people and the health care sector, it is safe to assume that this information may also be for another audience, such as policymakers or health care professionals. Although information regarding a specific group included on a health information web site may be of interest to members of that group, the producer of the web site may not have specifically targeted these members as the intended audience when they designed the content of their site. It is important to make the distinction between information *for* people and information *about* people.

3. *To what extent is the content of the selected health information web sites accessible?*

As outlined in the literature review, for the purposes of this project the term "accessibility" includes the usability of the web site and ease of understanding of the web site's content. The researcher was interested in knowing whether or not the selected web sites had taken measures to increase the usability and accessibility of their individual web sites and enclosed content. One sub-category – reading level – required the coder to apply a tool designed to assess the required reading level an individual would need in order to read and understand the material. The SMOG readability formula was applied to a randomly selected article on each of the selected web sites. This readability tool was chosen as it is particularly useful for assessing the readability level of shorter materials (Centre for Disease Control and Prevention).

For each of the categories outlined above, the researcher answered in the affirmative (denoted with the symbol * on the charts located in Appendix 4) if the sub-category was present in the content of each specific web site, and in the negative (denoted by a blank box on the following charts) if the sub-category was absent. It should be noted that the goal of applying content analysis to web sites was to assess which web sites were offering the specific content as outlined by the categories and sub-categories in the guidebook, rather than to assess the quantity of content dedicated to each category and sub-category. Therefore, the coder only assessed whether the sub-category was represented, not the extent of the representation.

Semi-Structured Interviews

Key informant semi-structured interviews were conducted with professionals involved in the establishment of the web sites in order to explore the evolution of the web sites' content. Four out of the seven web sites participated in the interviews; each running about 30-40 minutes in length. The semi-structured interviewsl involved a sequence of open-ended questions based on topics identified through a review of the selected web sites and conversations with the research team.

Participants were professionals associated with each selected web site. They were both government and non-government employees, and have some knowledge regarding the establishment, development and maintenance of the web site. There was no other criterion for participation, except for informed consent. Participants were recruited with the assistance of supervisors (i.e. personal contacts) and by approaching various people associated with each web site and asking for assistance. The principal

investigator contacted individuals associated with each web site, and four out of the seven organizations agreed to participate in the interviews. The principal investigator conducted a total of three semi-structured phone interviews; one additional interview was conducted via email.

The telephone interviews were a series of open-ended questions, with responses tape recorded. The following questions were asked of the participants:

General Information

1. To start off, can you tell me a bit about your involvement in the web site?

History of the Web Site

2. Can you tell me about the history of the web site?
    a. When did it begin?
    b. Why was it established? <policy, political pressure, change in organization>
    c. What are the name of organization's goals in communicating health information via the internet?

Content-related questions

3. What was involved in putting together this web site?
4. How did you decide what information (i.e. content) should be presented on the web site?
    d. How do you decide on the focus of the web site?
    e. Why did you decide to focus on X rather than Y?
5. In developing the web site what ethical and legal concerns did you consider?

Audience-related questions

6. Who is the intended audience of the web sites?
7. What measures did you take to ensure that the content you chose to include was relevant to your target audience(s)?

Accessibility-related questions

8. What steps did you take to ensure that the content on your web site is accessible to the general public?
9. Have you conducted an evaluation of your web site?

Quality-related questions

Over the last few years health care providers, governments, and the general public

have raised concerns regarding the quality of health information offered via the Internet.

10. How do you assure the quality of information you include on your web site? (What process do you follow?)
11. Who determines the quality of information on the site?

Future plans

12. Are there any plans to expand or alter the content of the web site in the future?
13. Is there anything else you would like to tell me about the web site that would help me understand it better?

DATA ANALYSIS

Content Analysis of Web Sites

Upon the completion of the data collection stage, all relevant information was organized and analyzed by the researcher. After all of the web sites were coded, the researcher organized the data into a tabular format in order to facilitate the data analysis process. The data analysis process followed a series of pre-defined steps. Once organized, the researcher carefully reviewed each sub-category for patterns and relations, and noted inconsistencies within the individual web sites. After each web site was individually analysed, the web sites were grouped according to their sector (i.e. government, non-profit, and commercial). Once grouped, the data from the various sectors were compared in order to highlight the commonalities and differences between the various sectors, as well as the individual sites. All of the data was analysed and compared in order to answer the original research questions.

Considering the large amount of data collected (55 features were coded across 7 web sites) it was not feasible for the researcher to comment on all the data gathered. Therefore, as a general rule only the sub-categories that were present on five of the seven web sites were analysed and discussed thoroughly. However, sub-categories that were present on one or two of the web sites were also discussed, as these "outliers" proved to be points of interest and were often worthy of detailed analysis and discussion.

In addition to assessing the inclusiveness of the information produced by the participating web sites, it is hoped that the results of this research inquiry will contribute to the understanding of issues related to the computerization of the health care system, specifically, issues regarding access to health information.

Semi-Structured Interviews

Upon completion of the interviews the data was transcribed, organized and analyzed. Data analysis consisted mainly of objectively reviewing the responses to the interview questions and identifying the main themes that emerged from the data. Upon completion of all four interviews, the interview tapes were transcribed and any notes taken by the interviewer were typed up and included. The researcher reviewed both set of notes and organized the data into groups of related material (i.e. data was organized around the questions). Transcripts from each interviewed were reviewed repeatedly, in order to identify themes. The number of participants and place of work that identified each theme was noted. Commonalities and differences among the thoughts and opinions of the research participants as they pertained to the research questions were analysed. Any outstanding comment raised by one of the participants was analysed to assess whether or not it should be included as a new theme or be excluded from further analysis (THCU). The findings of the data were then reviewed with respect to the results produced through the content analysis of the selected health information web sites to help the researcher understand the reasoning behind the decisions in relation to the web sites' content.

RELIABILITY & VALIDITY

Quantitative Data: Content Analysis

The reliability of a study involving content analysis refers to the *stability* and *reproducibility* of the results (Stemler, S, 2001).

- Stability requires the coders to re-code the same data in the same way and get the same results time after time; and,
- Reproducibility, also referred to as inter-rater reliability, involves a group of coders consistently applying the research tool in the same manner (i.e. classify content into categories in the same way).

According to Weber (1990), concerns regarding reliability often stem from "the ambiguity of word meanings, category definitions, or other coding rules" (p. 15). In order to enhance the reliability of a study involving content analysis a coding book and guidelines are developed, explicitly outlining the rules of coding, and the accompanying definitions. One popular way to measure reliability is to conduct an inter-rater reliability test in order to measure the agreement between coders (Stemler, S, 2001).

The validity of a study involving content analysis is determined by the extent to which the definitions (included in the tool) reflect the sub-categories. The validity of categories is enhanced by the inclusion of many words to arrive at the same meaning (Colorado State University). For example, including the words, kids, child, and youngsters as possible alternatives to the sub-category children.

One of the primary reasons to conduct content analysis is to collect objective information (Texas State Auditor's Office, 1995). Therefore, the researcher took great pains to ensure that the research tool was clearly laid out and defined, and the procedure followed (i.e. the application of the tool) was consistently applied to the sample. The following three steps were taken to enhance the reliability and validity of the study's findings and to ensure that the information gathered was objective.

Firstly, to enhance the reliability of the results, after the tool was applied to a web site, the coder re-coded the web site (on the same day) to ensure that data collected was accurate and complete.

Secondly, the coding scheme was tested to ensure the suitability of the categories and coding instructions, and the overall reliability of the tool. It was important that the list of variables was exhaustive and mutually exclusive in order to avoid confusion when applying the tool. Both the researcher and a colleague from the Centre for Clinical Epidemiology and Evaluation applied the coding scheme to a health information web site (a web site that is not included in the sample) in order to assess the reliability of the research tool. The inter-rater reliability score was 0.94. Generally, the acceptable range for reliability is between 0.80-1 (Texas State Auditor's Office, 1995). Therefore, it was decided that tool was adequate and with minimal revisions, it was ready to be applied to the sample. Upon completing the test, three of the sub-categories were re-written in order to clear up any potential misunderstandings that future coders may experience when applying the tool.

Lastly, to improve the validity of the results the definitions (included in the coding guidelines) were reviewed and expanded to ensure that there was an exhaustive list of words for each sub-category where applicable. For example, for the sub-category *people involved in same sex relationships*, words such as: gay, bi-sexual, homosexual, and lesbian were included in the coding guidelines to broaden the sub-category, allowing the coder to capture the data.

Qualitative Data: Semi-Structured Interviews

In terms of the semi-structured interviews, rather than using the terms "reliability" and "validity" Guba and Lincoln (1989) prefer the terms credibility, dependability, confirmability, and transferability when working with qualitative data. Therefore, rather than striving for validity (which seems unfeasible to determine if a piece of qualitative data is valid or true), every effort was made to protect the credibility of the research findings and the interpretations that were produced. In order to ensure the credibility of the interview data a member check was conducted with the participants. After all of the interviews and the preliminary stage of the data analysis was complete; the principal researcher synthesized the data from each participant, and sent participants an electronic copy of the data for their approval to make certain that the findings were interpreted accurately.

In qualitative research, reliability is represented by the dependability (or consistency) of the findings. The researcher took steps to ensure that the research process was consistent, logical, and documented (Robson, 2002). Dependability was enhanced by the preparation of an interview guide, a codebook outlining each sub-category in detail, and conducting a member check with participants.

Confirmability refers to the objectivity of the study. It is concerned that the interpretations of the data, by the researcher, are accurate and correctly describe the reality they set out to portray. In order to enhance confirmability the researcher consulted with field and academic supervisors throughout the research process, continuously question the research findings, and critically reviewing the data on an on-going basis (Peters, Abu-Sad, Vydelingum & Murphy, 2002).

Finally, the small sample size affects the transferability (generalizability) of the research to a larger population. However, transferability was not the goal of this study. The goal was to design and pilot a research tool to systematically analyse and compare the content of health information web sites. It is unknown to what extent the findings of this inquiry will be representative of health information web sites produced by various "producers of information", and considering the small sample size it is inappropriate to generalize the findings. However, this is not to suggest that the findings cannot be useful to inform research. When using qualitative research transferability it is the responsibility of the one doing the generalizing. The individual who is interested in applying the results to a different context or setting (i.e. a new group of low literate adults) is responsible for judging whether or not the transfer is appropriate.

LIMITATIONS OF RESEARCH

- The format of the research tool created for this study is not ideal for all web sites. Web sites vary in terms of structure, size and content. Therefore, designing a universal tool for all health information web site is highly problematic. This point is demonstrated by the difficulties associated with coding the BC Health Guide's web site. The research tool employed was unable to capture the scope and breadth of the web site's content, thereby "selling the web site short" in a sense.

- The unit of analysis limited the data collected. It is possible that the selected web sites contained information regarding some of the sub-categories that did not show up in this study due to limitations arising from the unit of analysis (i.e. two drill downs). For example, the BC Health Guide contains information regarding the importance of evaluating health information; however, because this information would take the coder three drill downs to retrieve; the coder was unable to include the information.

- The study sample size is quite small. Therefore, the research findings are not necessarily representative of, nor generalizable to, web sites authored by the various producers of health information. In addition, two of the three "producers of information" - non-profit and commercial - had only one web site representing each sector, while the third sector, government, had five representatives. Furthermore the web sites included in the study were not randomly selected, limiting the generalizability of the findings.

- The purpose of this project was to determine if certain information was presented or reflected in the content of the selected web sites. The research tool was not designed to quantify how much, or to what extent, each web site discussed a certain topic or area, or the quality of the information presented. Therefore, regardless of the scope and breadth, or the quality of the information, as long as the web site presented something (perhaps one article) that pertained to any given sub-category present in the coding scheme, the coder was obligated to state that the sub-category was included.

- The results from applying content analysis to health information web sites are limited by the categories and sub-categories included, and the definition of these categories. The researcher defined the categories, as she understood them. However, it is possible that others applying the tool would define the categories differently, thus producing different results.

- There are numerous readability formulae available to assess the readability of a piece of writing. Although, they are all based on a similar principle – the shorter the words, the easier and faster a piece of writing is to read – they are not all the same. The SMOG readability formula used to assess the readability level of the selected web sites for this study may or may not compare to other readability formulas.

- Assessing the font size of individual web sites is a difficult task due to the variation of monitor size and computer settings. Therefore, this sub-category is somewhat subjective as it depends on the size of monitor for which

CONTENT ANALYSIS RESULTS

The results have been presented in a tabular format. The research findings are organized under three main categories based on the research questions involving *purpose, audience* and *accessibility.* Please refer to the tables on pages 29-33 throughout the discussion to clarify or confirm any of the results discussed below.

Purpose of Web Site

Health Promotion	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Lifestyle	*	*	*	*	*	*	*	7/7
Social Det. of Health		*		*			*	3/7
Strategies		*					*	2/7

Prevention	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Injury	*	*	*	*	*	*		6/7
Violence	*	*		*		*	*	5/7

Service Delivery	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
			*		*	*		3/7

Health Care System	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
	*	*		*			*	4/7

Condition/ Disease Management	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Physical	*	*	*	*	*	*	*	7/7
Mental	*	*	*	*	*	*	*	7/7
Self-help/Self-care	*	*	*		*	*	*	6/7
Surveillance		*		*				2/7
Organ. & Publications				*				1/7

Health Protection	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
	*	*	*	*	*		*	6/7

News	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total

Gov't.	*			*	*		*	4/7
Hot Topics	*	*		*	*	*	*	67
Conferenc eHealth Events		*		*			*	3/7

Social Support	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Support Group Info.	*	*	*		*			4/7
Virtual with org.								0/7
Virtual with prof.								0/7
Virtual with other visitors								0/7

Comp. and Altern. Health	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
	*	*	*			*	*	5/7

Promo.	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Selling a product or service								0/7
Advertising a product or service					*			1/7

Med	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
	*		*	*	*	*	*	6/7

Evaluate Health Info.	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
	*	*			*			3/7

Tests/ Proc.	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
	*		*		*	*		4/7

Consumer Particip.	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
	*						*	2/7

Gender-Based Analysis	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
							*	1/7

Audience(s)

Children (0-12)	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link	*	*		*	*	*		57
Audience		*		*				2/7
Subject	*	*			*	*	*	5/7
N/A								

Youth (12-18)	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link	*	*		*				3/7
Audience	*	*		*				3/7
Subject	*	*		*	*	*	*	6/7
N/A								

Men	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)	*	*		*	*	*		5/7
Audience	*	*		*	*	*		5/7
Subject	*	*		*	*	*		5/7
N/A								

Women	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)	*	*		*	*	*	*	6/7
Audience	*	*		*	*	*	*	6/7
Subject	*	*		*	*	*	*	6/7
N/A								

Transgender	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)							*	1/7
Audience		*		*				2/7
Subject		*		*				2/7
N/A							*	1/7

Same Sex Relations	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)							*	1/7
Audience	*	*					*	3/7
Subject	*	*					*	3/7
N/A								

Seniors/ Aging	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)	*	*		*	*			4/7
Audience	*	*		*	*		*	5/7
Subject	*	*		*				3/7
N/A								

People with Disabilities	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Link (Y/N)		*		*			*	3/7
Audience		*		*			*	3/7

Subject	*	*		*			*	4/7
N/A								

Aboriginal Peoples	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)		*	*	*			*	4/7
Audience		*	*	*			*	4/7
Subject	*	*	*	*			*	5/7
N/A								

Ethnic Sub-Populations	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)		*					*	2/7
Audience								0/7
Subject		*						1/7
N/A								

Immigrants	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)	*			*				2/7
Audience	*	*		*				3/7
Subject		*		*			*	3/7
N/A								

Health Prof.	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)	*			*				2/7
Audience	*		*	*			*	4/7
Subject								0/7
N/A								

Educators/ Teachers	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)				*				1/7
Audience				*			*	2/7
Subject								0/7
N/A								

Parents	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)				*	*			2/7
Audience	*	*		*	*	*	*	6/7
Subject								1/7
N/A								

Rural Inhabitants	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)	*			*				2/7
Audience	*			*				2/7
Subject	*			*				2/7
N/A		*						1/7

General	**Health Insite**	**CHN**	**BC Health Guide**	**Health Canada**	**Med Broadcast**	**NHS**	**CWHN**	**Total**
Link (Y/N)			*					1/7

Accessibility

Reading Level (grade)	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Average
	16	15	15	23	11	16	14	16

Easy to Navigate	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
Toolbar	*	*	*	*	*	*	*	7/7
Link to site's homepage on every page	*	*		*	*	*	*	6/7
Title on each page	*	*	*	*	*	*	*	7/7

Search Feature	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
	*	*		*	*	*	*	6/7

On-line glossary	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
								0/7

Language	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
All info.		* French		* French			*French	3/7
Some info.	* Various languages		* French Spanish Vietnames e Punjabi Chinese					2/7

Alternative to text-based information	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
					*			1/7

Toll-free Number	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
				*			*	2/7

Font size	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
			*					1/7

Plain backdrop	Health Insite	CHN	BC Health Guide	Health Canada	Med Broadcast	NHS	CWHN	Total
	*	*	*	*	*	*	*	7/7

ANALYSIS & DISCUSSION OF CONTENT ANALYSIS

The analysis of the research findings has been organized according to the appropriate research questions.

What is the purpose(s) of the selected health information web sites?

To varying degrees, all seven of the health information web sites reviewed were multi-purpose sites. As demonstrated by the tables, none of the selected web sites limited their content to one specific area, but rather focused on a variety of purposes. This was anticipated given the high costs associated with establishing and developing a web site. In addition, the diversity of content reflects the scope of the organizations. Overall, the majority of the web sites tended to focus their energies in the areas of: Health Promotion; Prevention; Condition and Disease Management; Health Protection; News; Social Support; Complimentary and Alternative Health; and Medications.

Health Promotion

It was not surprising to find that all of the web sites reviewed offered information related to the "lifestyle" aspects of health promotion, such as nutrition, sexuality, and substance use. These are topics generally considered to be within an individual's "control" and deemed to be an individual's responsibility. Mainstream society feels that individuals and the choices they make greatly determine their own health. Producers of health web sites hope that disseminating information will lead to positive behaviour change (e.g. develop healthy eating habits), thereby improving an individual's health status.

The belief that all social determinants play a key role in determining an individual's health, and in determining one's ability to make choices and change behaviours, is an important tenet of health promotion philosophy. Only three of the seven web sites referred to the impact of the social determinants of health on individual and community health. Considering Canada's intimate history with health promotion (e.g. the Ottawa Charter for Health Promotion was written in Canada in 1986) it is not surprising that Health Canada's web site and the Canadian Health Network (CHN), two Canadian federal government initiatives, included information regarding the social determinants of health.

The Canadian Health Network (CHN), which is designed to be a *health promotion* web site, also offered information regarding strategies that individuals and communities can employ to address their health concerns. Strategies related to advocacy and community development enable people to increase control over and improve their own health, thereby involving their participation and leading to their empowerment. It is implied that to truly promote health, health promotion strategies must take place at individual, community and societal levels. However, the amount of attention CHN devoted to this area was minimal in comparison to the other two aforementioned sub-categories, lifestyle and determinants. (The coder identified only one area where health promotion strategies were discussed).

The Canadian Women's Health Network (CWHN) included information regarding both the social determinants of health and health promoting strategies. Since the CWHN

is interested in disseminating the results from studies employing gender-based analysis, it is not surprising that their web site discussed the social determinants of health. Analysing the social determinants of health is essential to conducting gender-based analysis, as gender-based analysis recognizes that women and men have different health needs (Women's Health Bureau, Health Canada). Therefore, in order to account for these needs, social factors (i.e. social determinants of health) must be considered. Articles regarding the relationship between health and poverty, as well as the link between racism and a woman's health status demonstrate the CWHN commitment to encouraging the site's users to broaden their definition and understanding of health.

In addition, the CWHN web site discussed strategies designed to empower women and encourage their active participation in their health. Since the inception of the women's health movement in the late 1960's, women (as individuals and as a community) have taken a much more active role in the maintenance and improvement of their health. Therefore, it is not surprising that the CWHN web site discusses issues regarding advocacy and activism.

Prevention

All seven on the web sites reviewed discussed injury prevention; however, only five of the seven web sites included materials regarding violence prevention. The BC Health Guide web site and Med Broadcast did not discuss the topic of violence. The BC Health Guide has a responsibility to offer health information of interest to all of its constituents. Although the exact number of violent acts committed in the province of BC is unknown, it can be assumed that for a portion of the population, issues regarding violence (e.g. spousal violence, violence against children, elder abuse) are indeed a real health concern. Considering Med Broadcast is produced by physicians, one would assume that physicians (depending on their area of expertise) are familiar with the possible physical and mental harm caused by violent acts. Regardless of either web site's reasoning to omit information regarding violence prevention, to exclude such information inadvertently sends the message that issues regarding violence are not important health topics, or should not be discussed.

Condition and Disease Management

The seven selected web sites all provided information on specific conditions or diseases. This is not surprising considering one of the Internet's greatest strengths and attractions, for both users and producers of health content, is its ability to disseminate a large amount of health information. The scope and breadth of health topics discussed on the individual web sites varied considerably.

Content regarding self-care was present on five of the seven web sites. Information concerning self-care and self-treatment appeared to be a key purpose for some of the web sites, particularly for NHS. NHS offers its users a "body key" whereby users can point to the area of the body and request information regarding symptoms and treatment options. The web site guides users through the query and offers advice regarding whether they should seek professional medical treatment or practice self-care. This service works much like a hotline (i.e. nurse line) – with the intention of screening potential patients before they visit emergency care facilities or seek alternative professional help. This is a particularly attractive for governments (especially those which govern countries with free, universal health coverage for all of its citizens) such as

Canada, the United Kingdom and Australia, as one of the key goals to self-care is deterring people suffering from *very* minor injuries or sickness (e.g. a shallow cut or cold) from unnecessarily visiting a doctor or the emergency department. Fewer patients vying for attention from health care providers decreases the stress on the health care system, thereby decreasing costs and waiting lines, and increasing efficiency. Understandably, self-care is an attractive strategy for governments to encourage.

Interestingly, the two Canadian federal government initiatives reviewed in this study, Health Canada and the CHN, did not discuss self-care options. However, considering the nature of Health Canada's web site (i.e. the Canadian federal government's main web site for health care) it made sense that this web site would not include such information. Nevertheless, it would be helpful if Health Canada had a listing of recommended health web sites that users could search, if they were unable to find the information they required on the Health Canada site. It was surprising that the CHN site did not provide information regarding self-care or self-treatment. The CHN is purported to be one of Health Canada's specific responses to the demand for computer-based health information for everybody. When reading the purpose of the web site, however, the CHN states that it provides information to Canadians to help them "stay healthy and prevent disease" (The Canadian Health Network) and does not concentrate on self-treatment options. However, the question remains – where do Canadians turn for self-care treatment options? Perhaps the federal government expects the provinces to fill this role (i.e. disseminating self-care information), while Health Canada and the CHN concentrate on the prevention side of things.

Health Protection

Six out of the seven web sites offered information designed to protect the health of their audience such as: information regarding consumer health-related products, environmental health and biotechnology. Considering the significance of this category it was unexpected that one web site, NHS Online, did not provide site users with this type of information. Much of the NHS web site was devoted to self-help and self-care, with less effort directed towards prevention and protection.

News

Presenting news articles on web sites appears to be a popular element to include on a health information web site. All of the web sites reviewed, excluding the BC Health Guide, included health-related information under the umbrella term *news*. As illustrated in the table, four of the seven web sites included information regarding the government. More interesting, the three web sites that did not include "news worthy" information about the government – NHS, BC Health Guide and CHN - were government web sites. However, the BC Health Guide and the NHS seem to focus on the clinical aspects of health (i.e. self-diagnosis and treatment, information regarding a large array of health topics), and do not include information regarding the health care sector or the government on their sites. In terms of the CHN web site, at first blush it was surprising to note that the web site did not include government-related news. However, after further analysis of the web site's content, and reviewing the goals of the web site, it appears that the CHN acknowledges that it is a federal initiative; however, at the same time it is a non-profit and wants to retain some autonomy. The CHN proclaims to be a health promoting web site and tends to focus its content on health promotion and prevention,

rather than disseminating information regarding the government and the health care system.

Six of the seven sites offered news articles regarding various health-related topics. The topics were updated by the hour, day, week or month, depending on the web site. Health Canada, the CHN, and the CWHN included information outlining upcoming health events and conferences. The BC Health Guide was the only web site that did not offer any information in this sub-category. The BC government purchased the content for the BC Health Guide and the structure of the web site from an American company, Health Wise. Therefore he content of the web site cannot be changed or altered easily, making it difficult to include timely news articles.

Social Support

Four of the seven web sites offered information regarding social support. Although none of these web sites offered the service of a virtual support group, the majority of the sites provided a comprehensive listing of the various support groups for specific topic areas and in specific geographic locations. More interesting, NHS and CWHN did not offer any information regarding social support. Despite the fact that NHS devotes much of its content to self-help, it appears that self-help is limited to the body (i.e. self-treatment), and does not include the mind, as there is no mention of social support groups. NHS includes an abundance of information regarding services in each geographic location. Adding a link to social support service to their "local services search" would require little effort or cost, and would be a helpful resource for people to refer to and use.

The CWHN was constructed with the purpose of strengthening the women's health movement through education, advocacy and information sharing, and to end the effects of discrimination. Although this web site speaks of the importance of sharing information, their definition of information does not include information regarding social support. It makes sense that social support would be an area that the Network would value, and thereby include on their web site.

Complimentary and Alternative Health

Five of the web sites offered information regarding complimentary and alternative health. However, there was considerable variance in the breadth and depth of the content included by each site. With the exception of the CHN, it did not appear that the web sites that offered information regarding alternative health devoted much effort to providing information regarding complimentary and alternative health therapies. In other words, although five of the sites included information in this area, the amount of content devoted to complimentary and alternative health, in comparison to the amount of information pertaining to traditional biomedical medicine offered by the web sites, the contribution was minimal. The CHN presented a hyperlink to complimentary and alternative health on the middle of their homepage, under the heading *Topics,* embedded between the topics -*cancer* and *determinants of health* – thereby signalling to site users that providing information regarding complimentary and alternative health is an important area to include.

Health Canada and Med Broadcast did not mention alternative health on their sites. Perhaps the fact that Med Broadcast is created by a group of physicians

influenced their decision to not include information concerning complimentary and alternative health.

Medication

Six of the seven web sites offered information regarding medication. Similar to the other sub-categories, the amount of information presented in this category varied considerably across all web sites. The Canadian Health Network was the only site that did not provide information in this area. Considering the importance of the topic, and the goal of the web site (i.e. prevention and health promotion) it is surprising that CHN ignored it completely.

Other Points of Interest

Overall, the seven web sites reviewed seemed to offer similar services (serve similar purposes), however, the extent to which the web sites provided information regarding each purpose varied considerably. For example, the commercial web site, Med Broadcast, was the only web site to advertise a product or service. In addition, the CWHN was the only web site to discuss the importance of applying gender-based analysis to research, specifically health research. HealthInsite and CWHN offered information regarding consumer participation in the health care system. This demonstrates their genuine commitment to involving the public in the decision making process. It was a bit surprising that the CHN did not include information of this nature on its web site. If the CHN is going to claim to be a health promoting web site then it should include information regarding consumer participation. Consumer participation is a health promoting activity, as it encourages consumers to participate in their own health. One last surprise to note was the failure of Health Canada to include information discussing the importance of evaluating web-based health information despite the federal government's commitment to disseminate health information via the Internet.

Who is the intended audience(s) of the selected health information web sites?

As discussed in the methodology section above, for purposes of this category the researcher recorded whether a web site contained information for, or about, a specific group (i.e. sub-category). In addition, the researcher was interested in knowing whether the web site included a direct hyperlink to the sub-categories, or whether the information regarding a group of people was found within another topic It is important to note that due to the structure of the BC Health Guide web site, the research tool, designed to conduct the content analysis of the web sites, was unable to capture the individual audiences. Therefore, for the purposes of this study the BC Health Guide's content is directed towards a "general" audience, rather than several different audiences.

As highlighted in the tables, five key sub-categories (i.e. audiences) emerged from the data. Children, youth, men, women and seniors were common audiences on all of the web sites reviewed, with each group designated by a hyperlink. With the exception of children and seniors, an abundance of information was provided for and about each of these "mainstream" groups on six of the seven web sites reviewed.

Children

The BC Health Guide and the CWHN did not include a hyperlink to children-specific information on their web sites. The other five web sites did offer information regarding children; however, only Health Canada and the CHN offered information *for* children. Both of these sites had numerous resources designed especially for children regarding a variety of topics. Games, quizzes, and puzzles were popular methods designed to educate children about various health-related topics.

Information provided by HealthInsite, MedBroadcast and NHS was designed for parents, teachers or guardians and was not intended for children. Therefore, children were the subject and not the audience of the information. In terms of these three particular web sites, much of the information involving children was in regards to sickness, flu symptoms and treatment, and small injuries (i.e. cuts and lacerations). Therefore, it would appear that HealthInsite, MedBroadcast and NHS concentrated their efforts on diagnosis and treatment, and focused less on preventing illness or injury and the promotion of children's health.

Seniors

Four out of the six web sites offered information regarding seniors. Government, non-profit and the commercial sector identified this group as a category that required specific information. Surprisingly, NHS did not highlight seniors as a group, although they provided a hyperlink for children. The implication may be that children or their parents are more apt to use the NHS web site than seniors. Perhaps due to the low Internet use among the senior population, NHS decided to disseminate health information via a different communication medium for this group.

Other Points of Interest

There was a lack of information regarding the health needs of minority groups. The CWHN was the only web site that included direct hyperlinks for people who are transgender and for people involved in same sex relationships. By providing a hyperlink to these sub-categories the CWHN is demonstrating that providing tailored information for people who are transgender and people involved in same sex relationships is a priority for the Network. As stated on the web site part of CWHN's purpose is to take "an active stance in ending discrimination based on gender, region, race, age, language, religion, sexual orientation or ability" (CWHN). The anti-discriminatory principles that guide their work are reflected in the content of their web site. Providing links for people who are transgender and for people involved in same sex relationships are examples of how the CWHN's guiding principles are put into practice.

The CHN provided information for, and about, people who are transgender. In addition HealthInsite and CHN provided information for and about people involved in same sex relationships. Although Health Canada did offer information regarding people involved in same sex relationships, because of the research constraints (i.e. unit of analysis was limited to two drill downs) the researcher was unable to discern if the information was for, or about, people involved in same sex relationships. More interesting, all three of the web sites that included information regarding these categories

organized their materials under the heading "sexuality". Therefore is appears that they were considered options within a topic (sexuality) rather than being positioned as a group of people. Interestingly, none of the web sites discussed heterosexuality as a possible category, implying that the information presented on the web sites were implicitly designed for people who identify themselves as heterosexual.

It was unclear to the researcher what the term "ethnic sub-populations" meant and whom it included, given that everyone on the planet would identify with this sub-category, as all humans are part of an ethnic sub-population. The CHN was the only web site that provided a hyperlink for ethnic sub-populations. However, the material that CHN included was limited to information and statistics *about* ethnic sub-populations, rather than information intended *for* ethnic sub-populations. Moreover, in every other instance CHN provided a link for a group/population they included information for *and* about the select group with the exception of the sub-category, ethnic sub-populations. By not including information for this sub-category, CHN gives the impression that the web site is not considered a primary source of health information for ethnic sub-populations. Interestingly, when the researcher re-visited the CHN site a month later this sub-category had been removed.

Overall, although some of the web sites included information regarding select minority groups, the scope and breadth of the information was shallow and the location of the information (i.e. where to find the information) was a guessing game.

To what extent is the content of the health information web sites accessible?

Steps were taken by all of the web sites to increase the accessibility of the content; however, these steps were inconsistent across all of the web sites. In other words, none of the web sites were constantly user friendly or accessible. The navigability of the web sites was the exception, as all of the web sites were fairly easy to navigate. However, reading level, availability of health information in other languages, providing an alternative to text-based information, and font size were neglected areas by the majority of web sites.

Navigability

All seven of the web sites had a toolbar that was accessible from all pages as well as a title reflecting the content of the page. With the exception of the BC Health Guide, all of the web sites provided a link to the homepage on every page, and a search feature. The four features – provision of a toolbar, link to site's homepage, a title, and a search feature - are basic navigational characteristics and are quite common to all web pages. Therefore, it was not surprising that the web sites reviewed contained all of these features

Reading Level

The content of all seven web sites was written at a higher level than grade six, the level recommended by literacy organizations. The content supplied by Med Broadcast was written at the lowest reading level, grade 11. This was surprising considering MedBroadcast is a commercial site and is under no legal obligation to ensure that their content is accessible to all Canadians. Health Canada's content was

written at the highest level, grade 23. The other five web sites, HealthInsite, CHN, CWHN, BC Health Guide and NHS had reading levels between grades15-16.

Considering 46 per cent of adult Canadians have low levels of literacy, the lack of effort invested in writing accessible information is particularly disturbing (International Adult Literacy Survey). A large proportion of the Canadian population is unable to fully understand the content of the selected health information web sites; thereby affecting their ability to tend to their health needs. Despite the awareness of the problem within the literacy, education and health fields, the plethora of readability tools, and the availability of *plain language* resources, health information web sites continue to present their information through language too sophisticated for many citizens. Although it is time consuming (and therefore costly) to produce plain language health information, in order for web sites to be effective agents of change people need to be able to retrieve and understand the available information.

Language

Health Canada, the CHN and the CWHN provided all of its content in both English and French. Considering that all content produced by the federal government must be available in both official languages, it is understandable why Health Canada and the CHN offered this service. Despite the fact that CWHN is not required by law to offer both English and French versions of its content, the CWHN web site is available in French and English. Again, this demonstrates the CWHN's commitment to honoring difference and ensuring fair representation. French is one of two official languages, and by CWHN offering its content in both languages they are demonstrating an equal level of respect for people who speak these two languages.

HealthInsite and the BC Health Guide offer select information in other languages. Various topic sheets presented on these web sites have been translated into other languages, such as: French, Spanish, Vietnamese, Punjabi and Chinese. Surprisingly, NHS does not offer any information in other languages, despite the numerous languages spoken in the United Kingdom.

Alternative to Text-Based Information

MedBroadcast was the only web site to offer an alternative to text-based information. Videos discussing various health topics across a wide range of topics were included on this web site. Perhaps because MedBroadcast is produced by physicians, the web site's producers felt it necessary to include an alternative means for users to learn about health issues. Because MedBroadcast is one of a few Canadian health web sites to offer health information via web-based videos and graphics they are filling an information gap. This is beneficial to both the producers of the web site and seekers of health information because it is a way to attract potential business in terms of advertising dollars (being one of a few to offer a service, thereby capturing a portion of the market with little outside competition), and people who prefer to learn about health issues through other means besides text-based information have resources at their disposal.

Font Size

The BC Health Guide was the only web site that used a 10' point font size or larger on its web site. Perhaps due to the large senior population residing in British

Columbia the provincial government is sensitive to the fact that seniors require larger text. According to 2003 statistics, 13.5 per cent of British Columbia's population is over the age of 65 compared to the national average of12.8 percent (Statistics Canada). Recognizing that font size is an issue for some people (e.g. the elderly, people with poor eyesight due to accident, injury or a medical condition) Health Canada did provide a hyperlink that allowed web sites users to adjust the font size to suit their needs. However, a proportion of the population would not have the technological or literacy skills to make the necessary changes in order to adjust the font size. When measured, the other remaining web sites' fonts ranged from 7.5 to 9.5, with the smallest font being presented on HealthInsite's web site.

In what ways do the different sources of information (i.e. government, non-profit, and commercial actors) influence the content-related dimensions –accessibility, quality, purpose, and audience – of health information web sites, thereby affecting the inclusiveness of the health information?

This research question was discussed throughout the above analysis; however, brief conclusions can be made comparing the various producers of information and the inclusiveness of content they create.

Government

Overall, government web sites offer a greater scope of information than non-profit and commercial web sites. Government web sites tend to concentrate more on self-care and self-treatment and the management of conditions and disease. They were more likely to include information for and about various groups of people, and on the whole provided specific information for a wide range of audiences. Although the government web sites did demonstrate attempts at increasing the accessibility of their content, their efforts were inconsistent and appeared random.

Non-profit

The non-profit web site included in the sample demonstrated a strong commitment to ensuring that the content on their web site reflected the lives of all women, regardless of race, class, sexual orientation, etc. The CWHN tended to focus on both the physical and social aspects of health equally, and encouraged web site users to get involved in the maintenance and improvement of their health. Similar to government web sites, the non-profit site invested resources into increasing the accessibility of the site's content, however, these efforts were inconsistent.

Commercial

The commercial web site offered a limited array of health information. MedBraodcast tended to focus on the clinical aspects of health and devoted much of its content to information regarding disease management and self-care. There was no mention of the social determinants of health, or information geared to meet the health needs of minority groups. The commercial site included promotional content. Similar to the government and non-profit web sites, MedBroadcast was inconsistent with its efforts to increase the accessibility of the web site's content.

RESULTS & ANALYSIS OF KEY INFORMANT INTERVIEWS

Key informant interviews were conducted with professionals associated with four of the seven web sites. Telephone interviews were conducted with The Canadian Women's Health Network (CWHN), the BC HealthGuide, and the Canadian Health Network (CHN), and HealthInsite participated via email. It is important to note that because the interview with HealthInsite was conducted via email, the researcher was unable to probe the interviewee for specific details. Therefore, the level of detail in their responses is somewhat limited in comparison to the other interviews. Throughout the data collection process, several issues and points of interest were raised by the participants. The following is a summary of the results and discussion of the findings from the interviews.

The Purpose of the Web Site

Although many of the web sites reviewed provide written information on their web sites outlining the purpose of their sites, the research participants provided additional information, in many cases confirming what the researcher suspected during the content analysis stage. According to data collected (through both interviews and content analysis) the purpose(s) of the web sites vary. All of the research participants stated that their respective agencies/organizations developed a web site to provide reliable, credible, and accurate health information to their target audiences. However, although all of the web sites shared this common goal, the sites tended to focus on different aspects of health.

The BC HealthGuide's web site serves a completely different purpose than do the other three web sites involved in the interviews. While the other three web sites concentrated their efforts on the promotion of health and prevention of illness, the BC HealthGuide focused on treatment. The BC HealthGuide's main purpose is to deliver clinical information and self-care options. After piloting the project in Victoria in 1999, the Ministry of Health came to the conclusion that people in the province would be open to the idea of self-care. The Ministry was interested in advocating self-care for minor injuries or conditions, such as minor cuts, or colds. Self-care was seen as a means to facilitate health care renewal in the province. According to the participant affiliated with the BC HealthGuide, the rationale for advocating this approach was related to increased efficiency and reduction in health care costs.

> *….with the escalating costs of health care, an aging population, and the tremendous impact brought on by government cost containment requirements, the approach was to try to find alternative approaches to be able to help the population of BC with health needs and also reduce the impact of unnecessary usage of health services.* (BC HealthGuide participant)

The Canadian Women's Health Network (CWHN), the Canadian Health Network (CHN) and HealthInsite seemed to have similar goals. Although all three of these web sites differ somewhat in their content and style, all of their work stems from a comparable goal - to help web site users find the necessary information to help them prevent illness and maintain or improve their health status. The structure of HealthInsite

and CHN are very similar in that the majority of their content is provided by their partners and affiliates. Therefore, one of the key purposes of these two web sites is to pull together information on a variety of subjects, from a number of agencies that are considered reputable. Both of these web sites provide an array of information, written from a variety of perspectives, by organizations that specialize in a specific topic area.

Selection of Content

The CWHN and the CHN both stated that the content available on their individual web sites is driven by what the agency is working on or what they have identified as a need (i.e. an information gap). For example, the CWHN is affiliated with the Women's Health Bureau of Health Canada, and acts as the Bureau's communications arm. To fill this role, the CWHN disseminates research based on gender-based analysis via their web site. In terms of the CHN, their efforts in the area of education are an example of how their work dictates the content of the agency's web site. Education is part of the Network's mandate. Therefore, the Network raises awareness about assessing health information by providing information regarding how to evaluate health information properly as part of the content on their web site.

The BC HealthGuide is in a unique position, as they do not select all of the content that they would like to have presented on their web site. The majority of the content on the BC HealthGuide is supplied by the vendor, HealthWise. HealthWise has been in operation since 1974, and since this time has developed a catalogue of clinical information regarding a host of topics. HealthWise ensures that the content they supply is customized to meet the client's needs. For example, HealthWise makes certain that the health information contains phone numbers for relevant to BC citizens, as well as using "British" rather than American spelling. Once the content has been approved, it is permanent; however, every three months the content is updated if need be. At this time, the British Columbia Ministry of Health is able to add or alter the content. For example, a topic such as SARS or Avian Flu is something that may be of more interest in Canada than the United States; therefore, the Ministry of Health could write an article to include on the BC HealthGuide and it would be posted when the web site is changed at the three month interval.

Accessibility

Overall, participants reported that ensuring the accessibility of their content was a key concern. However, they also stated that features related to accessibility and usability, such as presenting content using *plain language*, was something they strove to achieve, but was not listed as a requirement of their work. After speaking with participants, it appears that when able (i.e. when they had the time and resources at their disposable), agencies took appropriate measures to increase the accessibility of their sites' content; however, if improving accessibility was not convenient, or if deemed too costly, no efforts were made in this regard. For example, although three of the four participants stated that they tried to ensure that plain language was used in their content, it was not a deciding factor in the selection of content (i.e. deciding whether or not to post an agency's article on their web site).

> *Plain language…..is a consideration, but it is not a "we won't accept it*". (CHN participant)

In part, this explains the inconsistencies within this category according to the content analysis data. Although all of the web sites would like to facilitate the use of their web sites and content, it is not always possible because of limitations in terms of money, staff time and resources.

The CHN explained their partners' reluctance to require the use of plain language by pointing to the fact that much of the content submitted to the CHN is written by voluntary organizations that do not have the time to ensure that their articles meet plain language guidelines. Interestingly, the BC HealthGuide participant stated that Health Wise (the vendor who supplies the content for the all aspects the BC HealthGuide) considers their content to be written at a grade 9 reading level. However, when the researcher assessed the reading level of this web site using the S.M.O.G readability tool the content was written at a grade 15 level. During the BC HealthGuide interview this discrepancy was discussed and the interview participant stated that during one of the BC HealthGuide program's meetings there was a discussion around the definition of readability. It appears there was a gap between how the BC HealthGuide team defined this concept and how it was interpreted by HealthWise. According to feedback from the BC HealthGuide participant HealthWise defined readability in terms of school level and education level. The BC HealthGuide program team understood readability level to be in terms of health information – understanding health-related issues.

> *For us [the BC HealthGuide team] readability was (and this was defined by Rick Hudson) the understanding of health-related issues. We commonly agreed by what they [HealthWise Inc.] understood as readability - can I read the newspaper, can I read a generic article - and what we understand as readability -to what extent do I understand some or all of the body parts, diseases and treatments - that is one of the discussions (BC HealthGuide participant).*

It appears that the BC HealthGuide considered *health literacy* to be the appropriate measure, while HealthWise broadened its measurement to *general literacy*. For the purposes of this study the research team assessed reading levels in relation to general literacy. However, it is interesting to note that the BC HealthGuide thought about the differences between the two types of literacies and flagged the issue for debate. No other agency raised the issue of health literacy during the interviews.

Another issue related to accessibility that was identified by some of the participants was the difficulty in locating information. The Canadian Health Network and CWHN discussed the challenge of finding credible, quality health information regarding specific groups of people and specialized topics. The CHN and CWHN expressed frustration at the lack of information regarding certain groups of Canadians, namely, Francophone women living within and outside of Quebec, Aboriginal People, women of colour, immigrant women, and people who speak English as their second language. Despite their best intentions they reported being unable to include information due to the fact that it is not available.

> *It is hard too because a lot of times we would like to put that information up there, but it is not available. You don't always have the money to write something. It can be kind of frustrating….there is nothing about Black women's health in Canada. You can find a lot about African American Women, but life experiences are different in the US compared to Canada and you can't always compare the two (CWHN participant).*

Difficulty obtaining high quality health information in languages other than French and English was another issue raised by participants. This issue is discussed in detail in the section related to *ethical and legal concerns* of this report. It is important to state that, although at times it may appear to outsiders (e.g. this research team) that producers of information do not offer health information to certain minority groups simply because they are not interested in meeting their health information needs, at times the reason for this lack of representation may be more complicated. This is not to deny the definite lack of attention devoted to some groups and health topics on the part of many producers of information (i.e. government, researchers, health professionals); however, one must remember that some agencies and organizations work tirelessly to ensure that all groups can see their realities reflected in health content. Because of availability and legal issues, however, their efforts are often halted.

All of the participants asserted that much attention was paid to accessibility issues. Three of the web sites specifically cited consulting accessibility and usability criteria outlined by external agencies. For example, HealthInsite obtained assistance from Vision Australia to ensure that the web site met the requirements of the W3C Accessibility Initiative.[1] The CWHN and CHN also mentioned this Initiative and stated that they used the criterion established by W3C to guide the design of their web sites. The CWHN deserves specific mention, since they only have one person who is responsible for the web site. This web site manager has taken steps to facilitate the use of their web site to the general public.

> *In terms of the web site itself, I was asking the web manager about that and she uses relative font sizes so that users can re-size it at will and flexible tables. She really tries to follow the accessibility standards that were put out by the W3 Consortium. We also, if ever we post anything we post it in HTML and PDF just because a lot of screen readers can't read PDF. We try to make sure that HTML is always available, if possible. We still have users that use Netscape 4, so she has to keep that in mind. We are going to be moving to style sheets HTML – which is sort of becoming a standard with accessibility (CWHN participant).*

It was impressive to see that a small organization such as CWHN managed to take some of the necessary measures to ensure the accessibility of their web site's content. However, by the same token, it was surprising to hear that the CWHN did not conduct usability testing of their web sites. Even more interesting was the fact that the BC HealthGuide – a major government initiative – did not conduct usability testing of their web site. Although the BC HealthGuide will be conducting usability testing as part of their evaluation (which is currently underway) this web site was launched in April 2001. It has been up and running for three years without undergoing any testing regarding its usability. Perhaps this helps in part to explain the under utilization of the web site.

The CHN conducts usability testing with their various audiences. For example, the CHN's youth affiliate recently completed a usability test specifically focused on the youth consumer and gathered their thoughts regarding the CHN's web site. The CHN is making changes to the web site as a result of this test and the ensuing

[1] The W3C Accessibility Initiative creates resources designed to increase the accessibility of the Web for people with disabilities.

recommendations. The CHN participant also stated that they are considering conducting usability tests with other groups, such as seniors and people with disabilities. They are also currently considering re-designing the web site, and reported that an integral part of this re-deign would require additional usability testing.

Quality of the Content

The research participants stated that quality of web site content was a priority for their agencies. All of the web sites have established processes to ensure the quality of the information they post on their sites. All of the participants stated that their respective agencies have a committee (made up health professionals) that is responsible for checking the quality of the content submitted by information partners. HealthInsite, CHN and CWHN have established a set of criteria that outlines the necessary characteristics a piece of information must have in order to be eligible for publication on the organizations' web sites. The CWHN has a "collection development plan" and within this plan there is a list of criteria by which to evaluate content:

> *We won't post information that is linked to a commercial enterprise. We strive for balance and portray both sides of the story. You know we do make sure that we have this expert review committee and it says so on our site……There is a whole criteria for selecting and posting resources. We depend a lot on the expertise of our Board of Directors and out expert review committee, and the staff themselves. (CWHN participants)*

HealthInsite and CHN provide checklists on their web sites to delineate what features a piece of information must have in order to be approved. The CHN is currently updating their quality assurance framework and have recently completed an external review that explored what guidelines other health information web sites follow to ensure the quality of their content.

The BC HealthGuide seemed to have the most thorough process in place to ensure the accuracy of the information they disseminate via their web site. When asked, the BC HealthGuide participant stated that the program is extremely concerned with the quality of their information. When the BC HealthGuide was choosing the vendor for the program, quality of content was a key criterion in the selection process. Due in part to issues related to quality, as well as issues regarding liability, every item of content present on the BC HealthGuide is checked by experts from the Ministry of Health or from HealthWise. Nothing is published on the BC HealthGuide web site without going through several layers of approval and checks. The BC government has to be particularly meticulous due to the nature of the information they present (i.e. clinical information), as well as the accompanying liability issues. The relationship between quality of information and liability is explored in detail in the section *ethical and legal concerns.*

One of the participants noted that quality of information is not limited to posting of new articles or content, but also pertains to existing information already included in the catalogue of the web sites. Interestingly, the Canadian Health Network has developed a *Collection Development Strategy*, which includes maintenance as a key feature of the site's management, as it requires the individual departments of CHN (e.g. tobacco, cancer) to review their collection on an annual basis to ensure that the resources offered are timely, relevant and of high quality. Despite the natural tendency to want to build the

size of the collection and impress people with numbers, the CHN recognizes that they do not need 20 articles that say the same thing, but rather a few good quality articles in order to provide focus to the collection.

> *I came in here just 2 years ago – my mode is I want the best of the best – I want quality not quantity (CHN participant)*

Currently the CHN is in the process of updating their quality assurance framework.

Audience

For all of the web sites involved, the audience was quite large. Basically, the web sites were written for the general public, although the CWHN tried to narrow its target audience down to Canadian girls and women, and attract policy makers, researchers and other women's groups active across the country. Interestingly, only the BC HealthGuide mentioned the audience-related limitations associated with providing information via the Internet. When asked who the audience of the BC HealthGuide was, the participant offered the following answer:

> *Everybody that can use a computer, everybody that can read, everybody that knows how to type. We are fully aware about the digital divide so the users are self-selected (BC HealthGuide).*

The CHN raised the point that having a large target audience (i.e. the Canadian public) can be somewhat problematic when it comes to tailoring information and ensuring that the target audience's needs are met. For example, considering the variety of literacy skills of the Canadian public, the CHN participant stated that CHN *should* include information regarding a given topic written at numerous reading levels.

> *In our scenario our target audience is so broad in scope…..you need to make sure you have as many resources as possible available in my opinion at the different levels (CHN participant).*

Another point that bears mentioning is the debate regarding whether it is appropriate and respectful to signal various minority groups (e.g. people with disabilities, aboriginal people, and people involved in same sex relationships) out by providing specific information for them and about them in the form of a direct hyperlink. For the purposes of this report, the research team assumed that by a web site providing a link on a homepage, to a specific audience or group, the web site illustrates a commitment to supplying information regarding a particular group. However, after discussing this assumption with the participant from the CHN, it became apparent that there is another valid argument (which contradicts the researcher's assumption) to this debate. When asked why the CHN moved its information regarding people with disabilities to a topic area entitled *living with a disabilit*y, from its original position (formerly catalogued under the *audience* section of the web site) the CHN respondent stated:

> *We call it living with disabilities as opposed to people with disabilities. I guess it was very much the question of singling out a particular group….We moved it over to living with disabilities which we feel is more inclusive in the sense of it [including] the person living with them [people with disabilities]….We just felt that*

> *rather than saying people with disabilities and focusing on the person, living with disabilities seemed to open up more, which was really more of the information that we had in the collection as well. It was more [reflective of] some of the tools that are available, resources that are available for people with disabilities, so it really wasn't focusing in on people….it was more lifestyle information. Information that could help them [people who have disabilities and their families] have a more active lifestyle, a more participatory lifestyle. So we sort of felt that living with disabilities was more representative of the type of information that we were finding out there (CHN participant).*

The CHN participant makes a valid argument; one that the researcher did not consider when creating the research tool. This assertion leads to the question - is it appropriate for producers of information to designate information specifically targeted to groups of people - if yes, when it is appropriate, and for which groups? For example, a woman living with a disability possibly has some different health care needs (depending on the nature of the disability) compared to a woman who is not disabled. Therefore, some would argue that is a sign of equity and respect to ensure that there is health information available designed to meet women with disabilities' health needs. However, a woman with a disability is still a woman. Her disability is not her life, and, therefore, does not need to be the focal point of her existence. Much of the information catalogued under *women* on a health information web site would be relevant to a woman with a disability. Therefore, information specific to issues related to disability and women could be included under the content category, *women.* It is difficult to assess which approach is better. Perhaps conducting a needs assessment of women who are disabled and collecting their feedback may help producers of information gain insight into how the women would like to have their health needs met via a health information web site. Conducting usability tests with various groups of people presents another opportunity for producers of information to collect various groups' thoughts.

Ethical and Legal Concerns

All of the participants stated that ethical and legal issues were a main concern. It seemed that government-sponsored health information had to be particularly careful, especially with regards to clinical content. Due to the BC HealthGuide's focus on self-care, the majority of its content is clinical. Therefore, the BC HealthGuide web site has to be extremely careful and take extra measures to ensure that the information they are providing is medically sound, accurate and complete. The BC HealthGuide participant stressed the importance of accuracy and responsibility. All of the information is checked and re-checked by content experts (e.g. physicans, nurses).

> *This is one of the mechanisms that are actually religiously respected. Nothing is really launched or downloaded unless it has written approval (BC HealthGuide Participant).*

In addition, the legal agreement between HealthWise and the BC Government regarding the BC HealthGuide was quite extensive. Lawyers were involved from both sides right from the beginning of the partnership. The contract between the two parties was quite thick and as issues surfaced the document was amended to accommodate the changes. Many clauses were put in place to avoid liability.

Unlike the BC HealthGuide, the other three web sites involved in the interviews were not interested in providing clinical advice. The web sites took extra measures to ensure that the content they were providing was considered *information* and not *advice*.

> *We cannot provide advice, but we can provide information if it is related to the CHN mandate. There is a big big distinction between advice and information. We cannot provide anything as far as diagnosis, treatment, advice as to what they should do about it (CHN participant).*

The participant from the CWHN echoed CHN's sentiments, and stated that articles on their web site are intentionally written to outline options to people, but they do not encourage people to act one way or another.

> *…the articles aren't written as 'this is what you should do' but rather this is what other people do – sort of what we know about it [the topic] so far* (CWHN participant).

As pointed out by the CHN participant, care had to be taken to ensure that the wording of the information is neutral and presents both sides of a given story, as the provider of the information does not know the *context* of the individual receiving the information.

> *That information doesn't know your lifestyle, it doesn't know the health determinants that may factor, none of those things….. information always needs a context, that is the concern. We don't know the context that people are reading this information in. For example, I can have somebody – three different people - reading the same information and each of them will interpret it differently or the potential is there for interpreting it differently based on the perspectives that they are coming from, their context that they are looking at this information in. There are those lenses that get applied to any information and we cannot control that because it is a web site (CHN participant).*

In addition to the wording of the content, they manner by which an agency responds to information requests from site users also causes authors of web sites considerable distress. In order to ensure that responses are not misleading or interpreted improperly by web site users, the CHN has a set of templates and standard responses that they use to respond to information requests. Realizing the associated risks with responding to information requests, the CWHN purposely makes the location of the information request form less than obvious. This is in part due to the lack of resources (i.e staffing time) the Network has to devote to information requests or content suggestions, but is also partially related to the associated risks involved in supplying consumers with health information.

Offering health information in any language carries a certain degree of risk, however, when Canadian organizations endeavour to provide health information in languages other than French and English the associated risks are considerably magnified. As outlined by the CHN participant, offering accurate and reliable health information in other languages is a difficult service to provide for a variety of reasons. Firstly, locating trustworthy health information in other languages is difficult. Secondly, once this information is found, it is difficult to assess its accuracy if no one in the agency is able to speak the language or find someone easily to confirm the content. To

complicate this equation further, the amount of risk involved in offering health information in a variety of languages varies according to the nature of the information. In other words, if the information supplied by a web site discusses a relatively "harmless" topic such as exercise, and provides inaccurate information, the potential damage is much less severe than a web site that provides poor clinical information regarding a specific drug, condition or treatment. The CHN participant articulated this risk:

If it is something that is saying (like possibly active living) - saying that you shouldn't jog 26 miles the first day – then that is something that there is a low risk of someone taking something the wrong way. But if there is information in relation to whether or not they should be taking hormone replacement therapy that is a different risk. If you translate it [the information] into Portuguese – your risk is multiplied (CHN participant)

Participants from the BC HealthGuide and HealthIniste briefly mentioned dealing with individual privacy issues. The BC HealthGuide performed a privacy impact assessment, but no detail was provided as to what this entailed. Neither were the conclusions of the assessment disclosed. HealthInsite mentioned that they obtained advice from their Legal Section in regards to privacy and copyright. HealthInsite was the only web site to mention copyright. However, because the interview was conducted via email, there was no opportunity to probe the participant further regarding this point.

RECOMMENDATIONS FOR FUTURE RESEARCH AND PRACTICE

The findings of this research study have contributed to the development of the following recommendations in the areas or research and practice.

Research

In conducting this research and reviewing the results, two key areas for further research became apparent. They are:

- The creation of research tool that will measure how much information is included on a web site regarding a given sub-category (e.g. health promotion, rural inhabitants). In this research inquiry the researcher was able to discern if a sub-category was present; however, she was unable to determine to what degree a sub-category was represented. This would require the development of a tool that is able to quantify how much information is dedicated to a specific purpose or audience.

- Further investigation is needed regarding the inclusiveness of health information from the perspective of various groups.

Practice

There are various changes that could be adopted by the producers of web sites to increase the accessibility and inclusiveness of their content.

- Invest more energy and time ensuring that minority groups are provided with relevant information and have their realities reflected in the web sites' content (conduct usability tests prior to the launching of a web site). Individuals associated with each group (e.g. people involved in same sex relationships, people with disabilities, aboriginal peoples, etc.) should be consulted in order to review potential web site content and ensure its relevancy. Conducting a needs assessment with members of a given community could help producers of information gain a better understanding of what outstanding health information needs groups may have. Governments in particular must ensure that their web sites are meeting the needs of *all* of their constituents.

- Position information pertaining to all groups, especially minority groups, in a convenient and obvious location on the web site. People should not be forced to hunt through information in order to find content pertaining to their health needs. Conducting usability tests involving all potential site users would help improve the navigability of web sites and their overall effectiveness.

- Stop duplicating others' work. Many health information web sites tend to offer the same information targeted for the same groups of people. Conducting an environmental scan of existing health information web sites and their content will help producers of information fill a health information gap.

- Increase font size to at least a 10' point font size or preferably, utilize style sheets enabling individual users to adjust the font size to meet their individual needs.

- Use plain language to convey health information. Although this is not an easy task, especially given the complexity of medical language, plain language resources are available at literacy organizations and public health associations

- Provide an alternative to text-based information. Many people desire access to health information, however, not everyone prefers learning through written material. Videos, graphics, and audio resources allow people with varying abilities to benefit from web-based health information.

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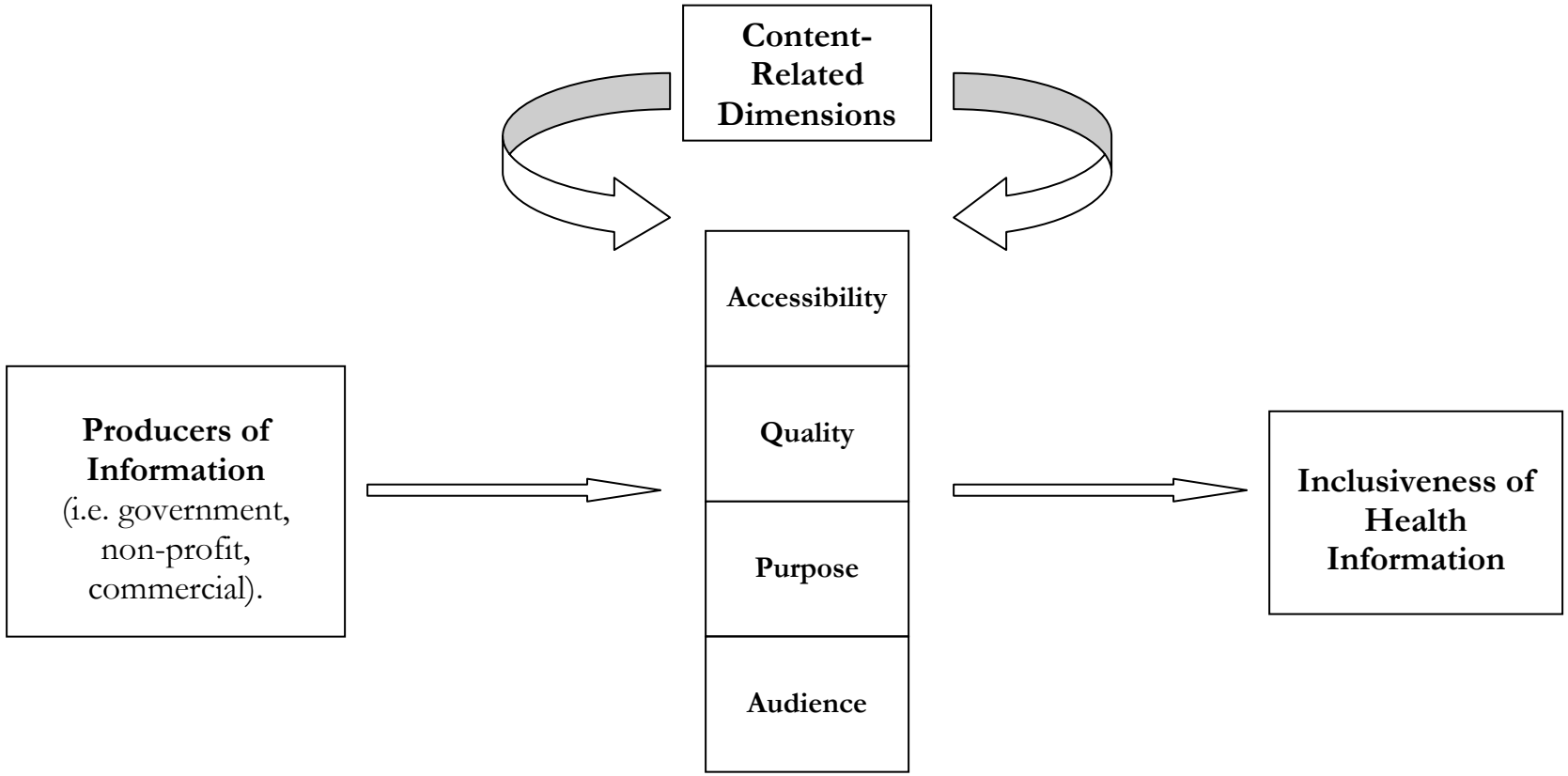
APPENDIX 1: CONCEPTUAL FRAMEWORK
Possible Content-Related Dimensions of Health Information Web Sites



APPENDIX 2: CODING GUIDELINES & SCHEME

Coding Guidelines

Units of analysis: The content of the web site that is located on the home page plus *two drill downs*. To *drill down* through content means to move from summary information (e.g. content of the homepage) to detailed data by focusing in on information. (Please see Appendix 3 for a detailed example of how to *drill down* information from a web site). In addition, any web pages (i.e. single web pages) in the form of legal disclaimers or choice of language (e.g. all federally sponsored Canadian web sites must have a web page providing a language option for the site's users, either English or French) are not to be included in unit of analysis. Therefore, such pages do not represent a *drill down* and should be ignored.

Name of Web site: State the name of the web site as it appears on the homepage.

Address of Web site: State the URL address of the web site.

Sector: State whether the web site is sponsored by a government, a non-profit organization, or a commercial/private actor.

A. Purpose

Indicate what the purpose(s) of the web site is.

1. Health Promotion: In order for a web site to be "health promoting," it should reflect a broad view of health, recognizing both lifestyle and social determinants of health and support a variety of strategies to maintain or improve one's health. Report on whether the web site offers information regarding all or any of the three features of health promotion. (Y/N)

    a. Lifestyle – disease/condition prevention, nutrition, exercise, sexuality, smoking, substance use/abuse, behaviour change, etc.
    b. Social determinants of health -housing, education, food, income, social status, social support networks, stable ecosystems, employment, working conditions, social justice and equity.
    c. Strategies – community development, building and working in partnerships, advocacy.

2. Prevention: Prevention can refer to both injury and violence. Report on whether the web site offers either or both types of preventative information. (Y/N)

Note*: *Disease and condition prevention is categorized under the above question as part of lifestyle.

a. Injury – offers advice on how to avoid getting hurt, such as: wearing a seatbelt, drinking and driving, diving, playing sports without the proper equipment (e.g. helmet, pads, etc.),
b. Violence – sexual abuse, family violence, child abuse, hate crime, etc.

3. Service Delivery: Report on whether the web site offers information regarding service delivery provided by the organization(s) sponsoring the selected web site or by others. Information could be presented regarding what services are offered, when they are offered, where they are offered and who is eligible to receive the service. Examples include: physiotherapy, homecare services in the area, telehealth, etc. (Y/N)

4. Health Care System: Report on whether the web site offers information concerning the health care system. Possible examples of this include: reports and documents (fact sheets) addressing issues in relation to the health care system, such as: outlining the responsibilities of the various actors involved in health care (provincial and federal responsibilities in health care), annual reports on the state of health care in Canada, the Canada Health Act, etc. (Y/N)

5. Conditions/Diseases: Report whether the web site provides information on specific conditions or diseases. Possible ways of presenting this information could include: fact sheets or an A-Z index including specific conditions or diseases; reports/publications discussing the prevalence or handling of outbreaks and disease; and information on organizations in charge of tracking disease.

   a. Physical – disease and conditions that affect one's physical body. (Y/N)
   b. Mental – mental health, such as depression, anxiety, stress, schizophrenia, etc. (Y/N)
   c. Self-help/self -care -does the web site offer information or advice on what steps a visitor to the site could take to restore their health (i.e. self treatment). (Y/N)
   d. Surveillance – tracks the prevalence of disease, offers information for travelers. (Y/N)
   e. Organizations and Publications – agencies that track and report on the prevalence of disease and epidemics.

6. Health Protection: Report on whether the web site offers information intended to protect the health of readers. However, this category is not to be confused with prevention or lifestyle. For example, applying suntan lotion to avoid sunburn is prevention, not health protection. Health protection could include: warnings and advisories about disease, environmental health, drug products, consumer products, medical devices, biotechnology. (Y/N)

7. News: Report on whether there is a section on the web site that is devoted to news (new information regarding a disease, condition, policy, health care service, conference, etc.) Indicate which type or topic of news, if any, is offered.

    a. Government – Policy information, reports on the healthcare system, change in government personnel (i.e. change in ministers), news from the ministry/government. (Y/N)
    b. Hot topics - News events that change daily or weekly regarding a specific disease or condition, a social determinant of health or strategy, or a story that is relevant to a time of year. For example, the importance of wearing sun block in the summer time. (Y/N)
    c. Conferences and health events – For example, conferences regarding research, health topics, the healthcare system, or a health fair. (Y/N)

8. Social Support: Report on whether the web site offers information regarding social support services, such as information about support groups or offers virtual support groups or chat groups. Virtual support groups provide an opportunity for the visitor of the web site to interact with the provider of the site, with professionals, or with other visitors.

    a. Support group information - Information about local or national support groups (contact information). (Y/N)
    b. Virtual support with organization - An opportunity to interact with the provider of the site. (Y/N)
    c. Virtual support with professionals - An opportunity to interact with a professional who can offer medical and emotional support to the visitor of the site. (Y/N)
    d. Virtual support with other visitors - An opportunity to interact with other visitors to the site. (Y/N)

9. Complimentary and Alternative Health: Report on whether the web site offers information about complimentary and alternative health treatments, such as: homeopathic medicine, naturopathic medicine, Ayurveda (traditional Chinese medicine), chiropractic medicine, reiki, massage, etc. (Y/N)

10. Promotions**:** Report on whether the web site contains material designed to encourage visitors to purchase products or services, or participate in research programs.
    a. Selling a product or service directly. (Y/N)
    b. Advertising a product or service. (Y/N)

11. Medication Information: Report on whether the web site offers information about medications, such as: how medications work, possible side effects, and generic names of prescription drugs.

12. Evaluate Health Information: Report on whether the web site contains information (i.e. a checklist) explaining to Internet users how to critique (assess) web-based health information. (Y/N).

13. Procedures and Tests: Report on whether the web site contains material outlining various procedures and tests, such as: colonoscopy, pap smear, ultrasounds, etc. (Y/N)

14. Consumer Participation: Report on whether the web site contains material related to consumer participation in the health care sector. This may involve being a part of a government committee specifically set up with the intention of soliciting consumer participation, or involve participating on an advisory committee for a non-profit or for-profit organization that is lobbying the government for health care change. (Y/N)

15. Gender-Based Analysis/Research: Report on whether the web site employs a gender-based analysis approach. The Women's Health Bureau at Health Canada defined gender-based analysis as "a method of evaluation and interpretation which takes into account social and economic differences between women and men, whether applied to policy and program development, or general life activities such as work/family roles."[2] A web site may explicitly utilize this approach (i.e. state that their research is grounded within a feminist framework) or they may implicitly work from this perspective. However, for the purposes of this tool (because it is difficult to assess whether or not a web site is implicitly conducting gender-based analysis) a web site must state that they are conducting gender-based analysis, or talk about the importance of working from this perspective. (Y/N)

B. Audience

Indicate if there is a hyperlink to a specific target group of people (e.g. children, youth, men, etc.), and if so, whether the use of language indicates (explicitly or implicitly) whether the group is the intended audience for the information, or just the subject of the information. In other words, is the information provided geared *for* a select group or is it *about* a select group? For example, if there is a link for children then you would check YES there is a link for this group. You would *click on* the link and assess whether the information is designed for children; this should be clear based on how the information is presented (yes, they are the audience). Although the information may be about children, it is possible that adults are

[2] Women's Health Bureau, Health Canada. *Gender-based analysis*. Retrieved March 23, 2004, from http://www.hc-sc.gc.ca/english/women/facts_issues/facts_gender.htm

the intended audience, for example a site offering child care advice to new parents; therefore, making children the subject and not the audience. It is also possible that the sub-category (e.g. children, youth, men, etc.) may be both the audience and the subject. For example, information about the Disability Rights Movement would likely be geared toward people with disabilities, who would also clearly represent the subject of the information. In this case people with disabilities are both the audience and the subject. Therefore, the coder would check both audience and subject on the coding sheet, indicating that the sub-category was both the subject and audience of the web site's content. In addition, it is possible that a sub-category could not have a link, but they could be an audience. For example, if there is a link for children it is quite possible that parents are the audience of the information. Therefore, you would note that parents are the intended audience, despite the fact there is no direct link (hyperlink) for parents. If the coder is not able to assess whether the information is for, or about, a particular group within the unit of analysis (homepage plus *one click*) the coder would check *N/A* (not available, or not able to discern) on the coding sheet.

1. Children (0-12): Report whether the web site offers information regarding children. (Infant, youngster, kids, etc. are words that reflect this age group and may be considered interchangeable.)
    a. Is there a link for children? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are children the audience or the subject of the content, or are they both?? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If children are the **audience** the information would be written in a manner appropriate for their learning. Simple language, cartoons and bright colors, a limited amount of text, interactive games, songs and simple quizzes are examples of what to look for when examining the content. Topics phrased in the first person, such as: "how to brush my teeth," and "my first day at school" indicate that the information is geared principally towards children.

    If children are the **subject** (and **not** the intended audience) of the content, the writing style of the information and the choice of topics will be geared towards an older audience. For example, "how to help your child stop wetting the bed" or the inclusion of sophisticated topics, such as: immunizations or medications for children are examples of when children are the subject and not the intended audience of the information.

    If the content contained information for and about children (children were both the audience and the subject) please check both audience and subject.

2. Youth (12-24): Report whether the web site offers information regarding youths. (Adolescent, teen or teenager, young adult, etc. are all words that reflect this age group and may be considered interchangeable.)
    a. Is there a link for youth? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)

b. Are youth the audience of the content, the subject, or are they both? (Y/N/)
c. N/A – not able to discern if the information is for or about a particular group.

If youth are the **audience** the information would be written in an age-appropriate manner and the topics included would reflect the interests of youths. For example, if the topic is contraception, youths are not likely to be interested in being lectured about the dangers of sex, rather they may be interested in learning the differences between various contraceptive devices, the advantages and disadvantages of each, where you can get them (from whom), and how you use them.

If youth are the **subject** (and **not** the audience) of the content, the writing style of the information and the choice of topics will be geared towards another audience, such as: parents, teachers, and healthcare professionals. For example, "disciplining your child", or "how to talk to teens about smoking", are examples of topics where youth would be considered the subject and not the audience of the information.

If the content contained information for and about youth (youth were both the audience and the subject) please check both audience and subject.

3. Men: Report whether the web site offers information regarding men.
    a. Is there a link for men? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are men the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If men are the **audience** the choice of topics would be of primary interest to men. Possible topics that could fall into this category include: prostate examinations, impotence, men and stress, or fatherhood.

    If men are the **subject** (and **not** the audience) the topics would be about men and their involvement, or relationship to, a specific subject area. For example, if the topic were "husbands and abuse", it is likely that men are not the intended audience for this article or content. Women, health professionals, friends, etc. are possible target audiences. Although it is possible men may be interested in reading the content regarding "men and abuse" it is assumed that they are not the primary audience for the information, and, therefore are considered the subject.

    If the content contained information for and about men (men were both the audience and the subject) please check both audience and subject.

4. Women: Report whether there is information on the web site that is targeted for women or if the information is about women.

a. Is there a link for women? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
b. Are women the audience of the content, the subject, or are they both? (Y/N/)
c. N/A – not able to discern if the information is for or about a particular group.

If women are the **audience** the choice of topics would be of interest to women. Possible topics that could fall into this category include: menopause, breast examination, hormone therapy, superwomen stress, and pregnancy.

If women are the **subject** (and not necessarily the audience) the topics would be about women and their involvement, or relationship to, a specific subject area. For example, if the topic was "helping a loved one through post-partum depression", or "how to find support for a woman who is being abused", it is likely that the woman experiencing post-partum depression or being abused is not the target audience for this information. Friends, family members, healthcare providers are possible target audiences for this information.

If the content contained information for and about women (i.e. women were both the audience and the subject) please check both audience and subject.

5. Transgender: Report whether there is information on the web site that is targeted for people who are transgender or if the information is about people who are transgender or transsexual.
   a. Is there a link for transgender? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
   b. Are people who are transgender the audience of the content, the subject, or are they both? (Y/N/)
   c. N/A – not able to discern if the information is for or about a particular group.

If people who are transgender are the **audience** the choice of topics would be of primary interest to them. Possible topics that could fall into this category include: hormone therapy for people who are transgender, surgery options, support groups, activism, advice on choosing a physician, and legal issues.

If people who are transgender are the **subject** (and **not** the audience), information could include: describing what it means to be transgender, dispelling myths and stereotypes of people who are transgender, providing support and advice to parents, partners and friends of people who are transgender.

If the content contained information for and about people who are transgender (i.e. people who are transgender were both the audience and the subject) please check both audience and subject.

6. Same Sex Relationships: Report whether the web site offers information regarding same sex relationships. Lesbian, gay, bi-sexual, homosexual, or queer are words that could illustrate a same sex relationship.
    a. Is there a link for same sex relationships? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are people who are involved in same sex relationships the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If people who are involved in same sex relationships are the **audience** the choice of topics would be of interest specifically to them. For example, topics regarding the legal rights and entitlements of same sex relationships, how to find a "same sex relationship - friendly" physician (i.e. a physician who is respectful and non-judgmental), and support groups, chat groups, or activist groups for people involved in same sex relationships.

    If people who are involved in same sex relationships are the **subject** (and **not** the audience), the information provided could be to dispel myths and stereotypes of people who are sexually involved with the same sex, or offer advice and support to parents whose children are gay, lesbian or bi-sexual.

    If the content contained information for and about people who are involved in same sex relationships (i.e. people who are involved in same sex relationships were both the audience and the subject) please check both audience and subject.

7. Seniors: Report whether the web site offers information regarding seniors. (Elderly and aging are also words that could be used represent an older age group).
    a. Is there a link for seniors? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are seniors the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If seniors are the **audience** the choice of topics would be of specific interest to them. For example, topics such as: active living (the importance of keeping busy - mind, body and spirit), and information regarding support networks (i.e. walking clubs) and recreational facilities.

    If seniors are the **subject** (and **not** the audience) the information provided will be about seniors, rather than for seniors. For example, topics such as: taking care of aging parents, or information regarding nursing care facilities and nursing support (i.e. where to find services).

    If the content contained information for and about seniors (i.e. people who are seniors were both the audience and the subject) please check both audience and subject.

8. People with Disabilities: Report whether the web site offers information regarding people with disabilities.
    a. Is there a link for people with disabilities? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are people with disabilities the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If people with disabilities are the **audience** the choice of topics would be specific to them. For example, specific health problems that people with physical disabilities are prone to having (e.g. bed sores), information regarding sexuality and fertility, contact information for advocacy groups, information outlining the responsibilities of employers, and information on the disability rights movement.

    If people with disabilities are the **subject** (and **not** the audience) information could include: dispelling myths and stereotypes of people with disabilities, and providing information on how to ensure that a building or space is accessible to all abilities.

    If the content contained information for and about people with disabilities (i.e. people with disabilities were both the audience and the subject) please check both audience and subject.

9. Aboriginal Peoples: Report whether the web site offers information regarding aboriginal peoples.
    a. Is there a link for aboriginal peoples? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are aboriginal peoples the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If aboriginal peoples are the **audience** the choice of topics would be of specific interest to them. For example, topics regarding different programs and services offered to aboriginal peoples, self-government initiatives, and health topics that are particularly relevant to aboriginal peoples (e.g. type II diabetes).

    If aboriginal peoples are the **subject** (and not the audience) the information provided would be about aboriginal peoples, rather than for aboriginal peoples. For example, reports that discuss the prevalence of type II diabetes in the aboriginal community, and articles detailing government-sponsored initiatives in aboriginal communities.

    If the content contained information for and about people with aboriginal peoples (i.e. aboriginal peoples were both the audience and the subject) please check both audience and subject.

10. Ethnic Sub-Populations: Report whether the web site offers information regarding ethnic sub-populations.

    a. Is there a link for ethnic sub-populations? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are ethnic sub-populations the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If ethnic sub-populations are the **audience** the choices of topics would be of specific interest to them. For example, health topics relevant to particular ethnic sub-populations (e.g. the prevalence of heart disease in the Asian community), language specific (i.e. translated into languages other than English and French) and culturally appropriate information.

    If ethnic sub-populations are the **subject** (and **not** the audience) the information provided would be about ethnic sub-populations, rather than for ethnic sub-populations. For examples, reports that discuss the prevalence of certain diseases and conditions within ethnic sub-populations, and articles detailing government-sponsored initiatives aimed at ethnic sub-populations.

    If the content contained information for and about ethnic sub-groups (i.e. ethnic sub-groups were both the audience and the subject) please check both audience and subject.

11. Immigrants: Report whether the web site offers information regarding immigrants.
    a. Is there a link for immigrants? If yes, please complete *part b* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are immigrants the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If immigrants are the **audience** the choices of topics would be of specific interest to them. For example, information on where and how to find a physician, and tips to help immigrants navigate the health care system.

    If immigrants are the **subject** (and not the audience) the information provided would be about immigrants, rather than for immigrants. For example, reports that discuss the health status of immigrants, and articles detailing government-sponsored initiatives aimed at improving the health of immigrants.

    If the content contained information for and about immigrants (i.e. immigrants were both the audience and the subject) please check both audience and subject.

12. Health Professionals: Report whether the web site offers information regarding health professionals.
    a. Is there a link for health professionals? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are health professionals the audience of the content, the subject, or are they both? (Y/N)
    c. N/A – not able to discern if the information is for or about a particular group.

    If health professionals are the **audience** the information would be written in a manner appropriate for them. For example, information regarding a health condition or disease would be laden with medical terms and scientific language. Information about the health concerns of various populations could be included, along with details regarding fees for the provision of various services and new health practice guidelines to follow.

    If health professionals are the **subject** (and **not** the audience) the information would be about health professionals, rather than for health professionals. For example, information on how to find a health professional, the responsibilities of health professionals, and information regarding additional fees not covered by the Canada Health Act that patients may have to pay to receive service.

    If the content contained information for and about health professionals (i.e. health professionals were both the audience and the subject) please check both audience and subject.

13. Educators/Teachers: Report whether the web site offers information regarding educators or teachers.
    a. Is there a link for educators/teachers? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are educators/teachers the audience of the content, the subject, or are they both? (Y/N/)
    c. N/A – not able to discern if the information is for or about a particular group.

    If educators/teachers are the **audience** choices of topics would be of specific interest to them. For example, resources would be provided to help educators teach their students about health-related topics, such as sexuality, contraception, nutrition, and the importance of being involved and engaged in a community. Contact information for various groups specializing in topic areas could be provided as a way for educators to access additional resources.

    If educators/teachers are the **subject** (and **not** the audience) the information would be about educators and teachers, rather than for educators and teachers. For example, information regarding the purpose and curriculum of health class, and a list of questions and answers explaining the importance of health class.

If the content contained information for and about educators/teachers (i.e. educators/teachers were both the audience and the subject) please check both audience and subject.

14. Parents: Report whether the web site offers information regarding parents.
    a. Is there a link for parents? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are parents the audience of the content, the subject, or are they both?
    c. N/A – not able to discern if the information is for or about a particular group.

If parents are the **audience** the choices of topics would be of specific interest to them. For example, information about the health and nutritional needs of children and youth at the various stages of their lives, advice on how to relate to children and youth, and tips regarding discipline. Parent support groups and chat groups are also possible sources of support for parents.

If parents are the **subject** (and **not** the audience) the information would be about parents, rather than for parents. For example, information regarding how youth can approach their parent(s) if they have a problem or a situation that requires additional support.

If the content contained information for and about parents (i.e. parents were both the audience and the subject) please check both audience and subject.

15. Rural Residents: Report whether the web site offers information regarding rural residents.
    a. Is there a link for rural residents? If yes, please complete *part (b)* of the question. If no, please select no and move to the next question. (Y/N)
    b. Are rural residents the audience of the content, the subject, or are they both? (Y/N)
    c. N/A – not able to discern if the information is for or about a particular group.

If rural residents are the **audience** the choices of topics would be of specific interest to them. For example, information about government-sponsored health initiatives aimed at increasing the accessibility of health information for rural residents (e.g. telehealth, nurse line), information about additional services offered to rural residents (e.g. air ambulance), and information regarding in-person and virtual support groups.

If rural residents are the **subject** (and **not** the audience) the information would be about rural residents, rather than for rural residents. For example, written reports outlining the challenges and barriers rural residents face when trying to access health care services.

If the content contained information for and about rural residents (i.e. rural residents were both the audience and the subject) please check the term both audience and subject.

16. General: If the web site does not provide health information to a specific group(s), but rather to a general audience please check YES. (Y/N)

C. Accessibility: Assess the accessibility of the content of each web site.

1. Reading Level: Apply the readability tool to a random article on the web site (within the unit of analysis) to assess what level of reading a person must have to understand the text. The readability tool is located at the end of this document, in Appendix 3. What is the reading level of the information? (i.e. the grade)

2. Easy to Navigate: Report whether the selected web site is easy to navigate.
   a. Toolbar – Is there a toolbar offered on every page with navigational links and consistent icons? (Y/N)
   b. Link to site's homepage – Is there a link to the web site's homepage on every page? (Y/N)
   c. Title on each page – Is there a title on each page identifying the focus or subject of the page? (Y/N)

3. Search Feature – Is there a sitemap or a search feature? (Y/N)

4. On-line glossary – Is there an on-line glossary? (Y/N)

5. Language – Report whether the information on the web site is offered in another language. If yes, please record which language(s). (Y/N)
   a. Is **all** of the information offered in another language?
   b. Is **part** of the information (e.g. information regarding certain diseases or conditions) offered in another language?

6. Other means to access information – Is there a toll-free number offered so people without the proper software can get the information they need in another format free of charge? (Y/N) ***Note: The number must correspond with the web site page (i.e. be a toll-free number for the information provided on the web site not to another health information service such as telehealth).***

7. Font size – Is the font size of the information at least 10 point font size? To check the font size follow the steps: 1) choose a word(s) that appear to be written in the smallest font; 2) highlight and copy the word(s) and paste them into a Word document; 3) put the cursor on the word(s) and see what the font size is by looking at the top of the screen, in the toolbar. (Y/N)

8. Plain background – Is the background plain or is there a pattern imprinted in the background. Select yes if the background is plain. (Y/N)

Appendix 3

Homepage This is the homepage for the Canadian Health Network (CHN). From this page the coder would select a piece of information they were interested in exploring. For example, if the coder was interested in exploring the term *women* under the section "groups", the coder would select (drill down) women.	
Drill Down 1 This is the page that appears when you click on the term *women*. From this page the coder would want to "drill down" one step further by choosing a story, an article, or any piece of information on the page. In this example we chose the story <u>Menopause with hormone therapy: what are the alternatives</u>?	

Drill Down 2

This is the final step. The coder is limited by the unit of analysis (two down drills) to go any further. Therefore, the unit of analysis is any content found within the two drill downs (i.e. these three pages).

Any topic, group or piece of information the coder wishes to explore must follow this procedure.

Coding Form – Content Analysis of Health Information Web Sites

Coder _____ **Date** _____

Name of web site _____

Address of web site _____

Sector_____

A. Purpose(s)

Health Promotion	Yes	No	Comments
a. Lifestyle			
b. Social Determinants of Health			
c. Strategies			

Prevention	Yes	No	Comments
a. Injury			
b. Violence			

Service Delivery	Yes	No	Comments

Health Care System	Yes	No	Comments

Condition/Disease Management	Yes	No	Comments
a. Physical			
b. Mental			
c. Self-help/Self-care			
d. Surveillance			
e. Organizations and Publications			

Health Protection	Yes	No	Comments

News	Yes	No	Comments
a. Government (policy, hc system)			
b. Hot Topics			
c. Conferences and Health Events			

Social Support	Yes	No	Comments
a. Support Group Information			

b. Virtual with organization			
c. Virtual with professionals			
d. Virtual with other visitors			

Complimentary and Alternative Health	Yes	No	Comments

Promotions	Yes	No	Comments
a. Selling a product or service			
b. Advertising a product or service			

Medications	Yes	No	Comments

Procedures and Tests	Yes	No	Comments

Evaluate Health Information	Yes	No	Comments

Consumer Participation	Yes	No	Comments

B. Audience(s)

Group	Yes	No	Audience	Subject	N/A
1. Children (0-12)					
2. Youth (12-24)					
3. Men					
4. Women					
5. Transgender					
6. Same Sex Relationships					
7. Seniors/Aging					
8. People with Disabilities					
9. Aboriginal Peoples					
10. Ethnic Sub-Populations					
11. Immigrants					
12. Health Professionals					
13. Educators/Teachers					
14. Parents					
15. Rural Inhabitants					
16. General					

C. Accessibility

Accessibility Characteristic	**Grade**	**Comments**
Reading Level		

Accessibility Characteristic	Yes	No	Comments
Easy to Navigate			
d. Toolbar			
e. Link to site's homepage			
f. Title on each page			

Accessibility Characteristic	Yes	No	Comments
Search Feature			

Accessibility Characteristic	Yes	No	Comments
On-line glossary			

Accessibility Characteristic	Yes	No	Language
Language			
a. All information			
b. Some information			

Accessibility Characteristic	Yes	No	Comments
Toll-free number offered so people without the proper software can get the information they need in another format			

Accessibility Characteristic	Yes	No	Comments
Font size (at least 10 point font)			

Accessibility Characteristic	Yes	No	Comments
Plain background			