Construction of a quality evaluation model of Internet information for Health Virtual Libraries of Pan American Health Organization. Results from an adolescent specialized health virtual library of Mexico.

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Abstract

The Health Virtual Library (HVL) Adolec Mexico, of the BIREME/PAHO/WHO's HVL project, contributes to the development of adolescent health from Mexico to Latin America and the Caribbean by promoting the use of scientific and technical health information on the web. The Second Regional Coordination Meeting of Health Virtual Library held in Cuba in 2001, urged to support a project of Adolec Mexico aimed to generate a quality evaluation model for the Latin America and the Caribbean HVL network. This model will be targeted to the experts and public, and its implementation will be promoted in the HVL network. The HVL Adolec Mexico is actually working (2001-2003) through a methodology that includes: a) a complete literature review process for a "state of the art" paper, b) construction of a quality evaluation instrument that will consider access, design and contents criteria; then, experts' validation, internal reliability validation, and validity of construct tests of the evaluation criteria will be held, c) a pilot test will be held by those responsible of the PAHO-HVLs into their own HVLs and d) the instrument will be then organized, procedures stablished and the final model refined. We present here our preliminary results that show the most relevant of the state of the art including a classification of internet resources, the evaluation instrument that will include 3 areas, 29 categories, and 74 criteria, and some advances of the validation and pilot tests over different PAHO-HVLs.

Introduction

The Health Virtual Library (HVL) Adolec Mexico (www.adolec.org.mx), of the BIREME/PAHO/WHO's HVL project, contributes to the development of adolescent health from Mexico to Latin America and the Caribbean by promoting the use of scientific and technical health information on the web. HVL´s represent a new alternative for knowledge difussion, education and health services due to the consolidation of Internet as one of the main sources of scientific information all over the world. At the beginning of this millenium, the Panamerican Health Organization (PAHO) considers HVL´s as strategic instruments for scientific information dssemination and the universal and equalitarian access to health services in Latin America and the Caribbean (1).

In 1998, during The Sixth Latin American and The Caribbean Health Information Sciences Meeting held in San Jose de Costa Rica, the Regional Library of Medicine of Brasil (BIREME) proposed the creation of the HVL´s for that region, by 1999, they were already functioning (2). By 2001, during The Second Regional Coordination Meeting of Health Virtual Libraries held in Cuba, there was a call for supporting a project of ADOLEC

Mexico aimed to generate a quality evaluation model for the Latin America and the Caribbean HVL network. This model would be targeted to providers and public, and its implementation would be promoted in the HVL network.

Publishing on the Internet is so simple that quality of the information and information services is a crucial aspect in this context. For example, just in 1994 more than 3.5 million documents were created and published on Internet, and this number increases impressively every year (3). This action can create an overload of unfiltered and unrefined information (4). Besides, information variability offers a great difficulty for developing quality control regulations (5-7). This situation generates a problem of credibility for the information sources, which urges to correct with permanent evaluations.

In spite that the HVL principle of "the establishment and application of evaluation and control of quality integrated mechanisms", it has not been adopted a specific model for controlling the quality of the information published on its sites and, otherwise, it has been left to the National Consulting Committees the decision of the quality control methods to follow. For that reason, there is still a lack of an official quality control system for every National HVL and the PAHO-HVL network.

The aim of this paper is to present the advances in the creation of a quality control and evaluation model specific for the ADOLEC Mexico HVL, which later will be presented to all the PAHO-HVL Network. This model intends to considerate the quality evaluation of information services from two different point of views (services providers and users), and four distinct levels of providers (Administrators, professionals, information technicians and librarians). Reachable, measurable, observable, understandable and reasonable criteria (8), and specific indicators for evaluating access, design and contents of the Internet information service have been included in this model in such a manner that they orient the establishment of the proceedings for design and implementation of health information resources.

Objective

We present here our preliminary results that show the most relevant of the state of the art including a classification of internet resources. The process of creation of the evaluation instrument that includes 3 areas, 15 categories, and 63 criteria, and some advances of the validation and pilot tests over different PAHO-HVL network.

Methodology

The HVL Adolec Mexico is actually working (2001-2003) through a methodology that includes: a) a complete literature review process for a "state of the art" paper, b) construction of a quality evaluation instrument that will consider access, design and contents criteria; then, experts' validation, internal reliability validation, and validity of construct tests of the evaluation criteria will be held, c) a pilot test will be held by those responsible of the PAHO-HVLs into their own HVLs and d) the instrument will be then organized, procedures stablished and the final model refined. This process has now reached step b) as explained next.

a) Literature review process.

A qualitative design through a documental research method was performed. We consulted the most important search engines (Altavista, Lycos, Google, etc.) and on line databases (Medline, Proquest, BVS). On each one of these sources we made specialized searches using the keywords quality, evaluation, control, internet and health information,both in spanish and in english. First, we performed the searches using single words, later we made boolean combinations of two, three or more terms. We did not use semantic or proximity operators, because we had not started conten analyses of documents, besides, the above mentioned databases are very limited for these procedures.

As a result, we located and evaluated more than 200 documents. Through a preliminar temathic content analysis we reviewed the documents and identified no more than twenty that showed the main aspects of the topic, while the rest only mentioned the matter or elaborated practical uses for the proposals made by other authors. Alos, these references pointed out to other important documents that had not been previously located, which added 30 important documents to our previous list and that were recovered because we noticed that they were represntative of the matter. Of these fifty documents, only 38 fitted the quality criteria for this work, according to Ciolek´s criteria (9), and they were subject to a sinthactic and semantic deep reading using the ATLAS/ti software. We elaborated our main analysis categories and aloowed us to define the health information quality "state of the art" table which will be presented later on this paper.

b) Construction of a quality evaluation instrument and validation

As the last step on the document analysis process we performed an inter-case analysis for some of the categories identified before, which allowed us to identify those authors who best represented the development of every criteria.

Later, we organized all the criteria in a list, called "candidate criteria", which were revised to find the most used ones and the questions used as indicators for every criteria. We identified a list of 74 criteria which were classified and submitted to the administrators of the PAHO-HVL network to find out consensus. Then, four of the researchers reviewed again the candidate criteria to identify the most important criteria for the HVL quality evaluation system.

After this review, we arranged a list of criteria, classified according to the areas and categories explained later on this paper, and send it again for the next step in the process.

c) Pilot test by the responsible of the PAHO-HVLs into their own HVLs

Once we arranged the set of criteria to be selected for the instrument, we prepared a web site where we put the instrument according to areas and categories identified, as we will see in the Results section.

We decided to convert every criteria to a yes/no question-like format, in order to verify if the criterium exist, and to allow us to manipulate the answers of the pilot test to be held by the responsibles of every HVL on the PAHO Network.

We then sent a letter of invitation to participate to every HVL responsible on the PAHO Network. This is the moment where we are now, and we are waiting for the answers in order to perform the validation tests.

d) Organization of the instrument, procedures stablished and final model arrangement.

This step will be performed once we have finished the validation procedures.

Results

The state of the art on quality of health information on the Internet resulted from the identification of a series of documents that work on the topic as follows.
One of the most recognized works on this line is the one of Ciolek (9). The discussion about quality of information on the Internet derives from him and later goes from independent authors like Oliver et al. (10), Luz et al. (11) and Smith (12), to the perspective of organizations like the Health On the Net Foundation (13), and Health Summit Working Group (6), who try to facilitate the process of evaluating the quality of on line resources. From the documental analyses we performed, we elaborated a classification of those efforts: a) proposals of criteria to evaluate web sites, b) references or guides to authors and other sites that evaluate other on line resources, c) evaluation of resources and creation of indexes, and d) proposals of evaluation of non-traditional materials. Table 1 (at the end of this document), shows the main types of resources encountered on the Internet.

One of the most important aspects to considerate when evaluating the quality of the sources of information on line, is that it can be performed from two different general perspectives, from those who offer the service and from those who receive it. For each one of them, there are different levels, for the former, levels of evaluation can be: as a coordinator of the resource (i. e., director of an institutional web site), as specialist of a specific topic (i. e., an expert in psychological disorders of the adolescent), as an information system specialist (i. e., computer programmer, web master), and as specialist in information services (i. e., a librarian). On the other hand, the evaluation levels for the information users can be: as an expert user or as a novel user of information services. This classification could guide the formulation of evaluation criteria, in the intend that the information resource satisfy every users needs.

On the construction of the quality evaluation instrument we found that previous authors have proposed a series of criteria and instruments that are intended to end users and service providers (Table 2, at the end of this document).

From these works, we have developed an instrument for service providers that is ordered according to three areas: evaluation of access and context, evaluation of design and evaluation of contents (14). These areas are divided into 12 categories (15) and 29 indicators, to finish as 74 criteria in a question-like format (see Table 3 at the end of this document). Criteria were organized in blocks of two criteria according to its indicators. This was done in order to perform a statistical analysis for construct validation, but in the real instrument, the questions are answered one at a time. (see Table 4 at the end of this document).

Also, we separated the instrument in two sections. Section 1 corresponds to the essential quality criteria, a set of 74 questions that are to be answered as yes/no. Section 2 corresponds to the complementary quality criteria, a set of 11 questions that are to be answered as a presence or absence of the criteria, but its presence adds quality to a resource and its absence does not reduce it (Table 5, at the end of this document).

Finally, we developed a four question opinion section, which will help us know the thoughts of the PAHO-HVL participants about our instrument (Table 6, at the end of this document).

The instrument has already been uploaded to the ADOLEC Mexico web site (www.adolec.org.mx/calidad) see Figure 1 (at the end of this document), and a letter of invitation has been sent to all the PAHO_HVL administrators in order to make a pilot test. We are now waiting for their answers.

Discussion

The work of compiling the information to finish in the development of an instrument capable of measure the quality of an on line information resource has taken us into another dimension of the health services, the dimension of user satisfaction. All the effort made to arrange and set an information resource, in this case in the form of a health virtual library, must be oriented to comply the needs and requirements of the users to which it is directed.
The prerogatives of our institutions and organizations have launched us into this task and we are committed to offer a high quality health information service. We hope that from this point and through the implementation of the final instruments we spend no more than one year. But from that date, the task will be divided in two: the refinement of the quality evaluation instruments and the enrichment of our own HVL services based on the recommendations of these instruments. Once finished, there will be another major task, the dissemination of the quality evaluation instruments all through the PAHO-HVL Network and the quest for a standardization of the quality criteria for every health information service on the world.

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Figure 1. Partial image of the quality evaluation instrument on its web-site.
http://www.adolec.org.mx/calidad/

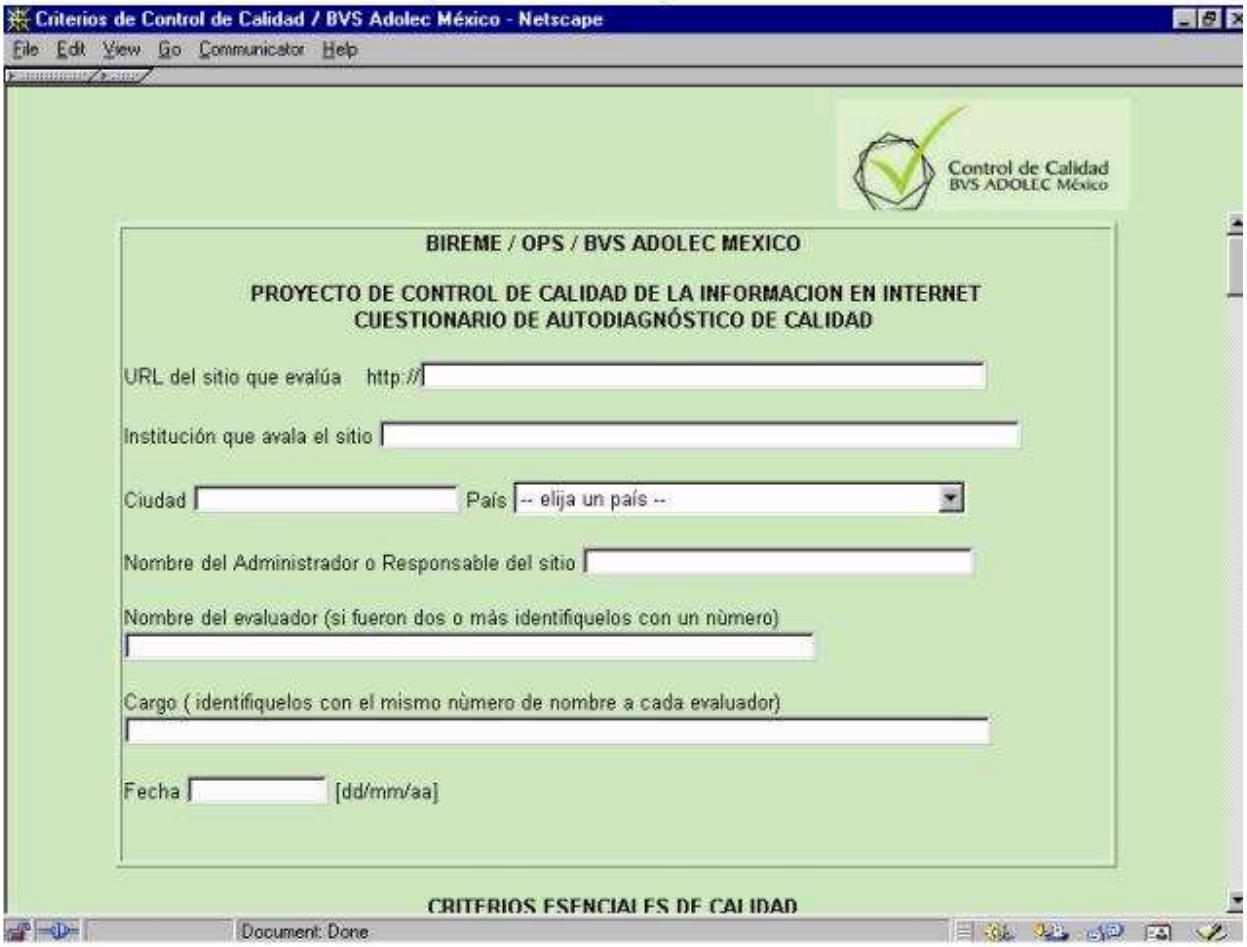

Table 1. Classification of the resources encountered on the Internet about quality of health information.

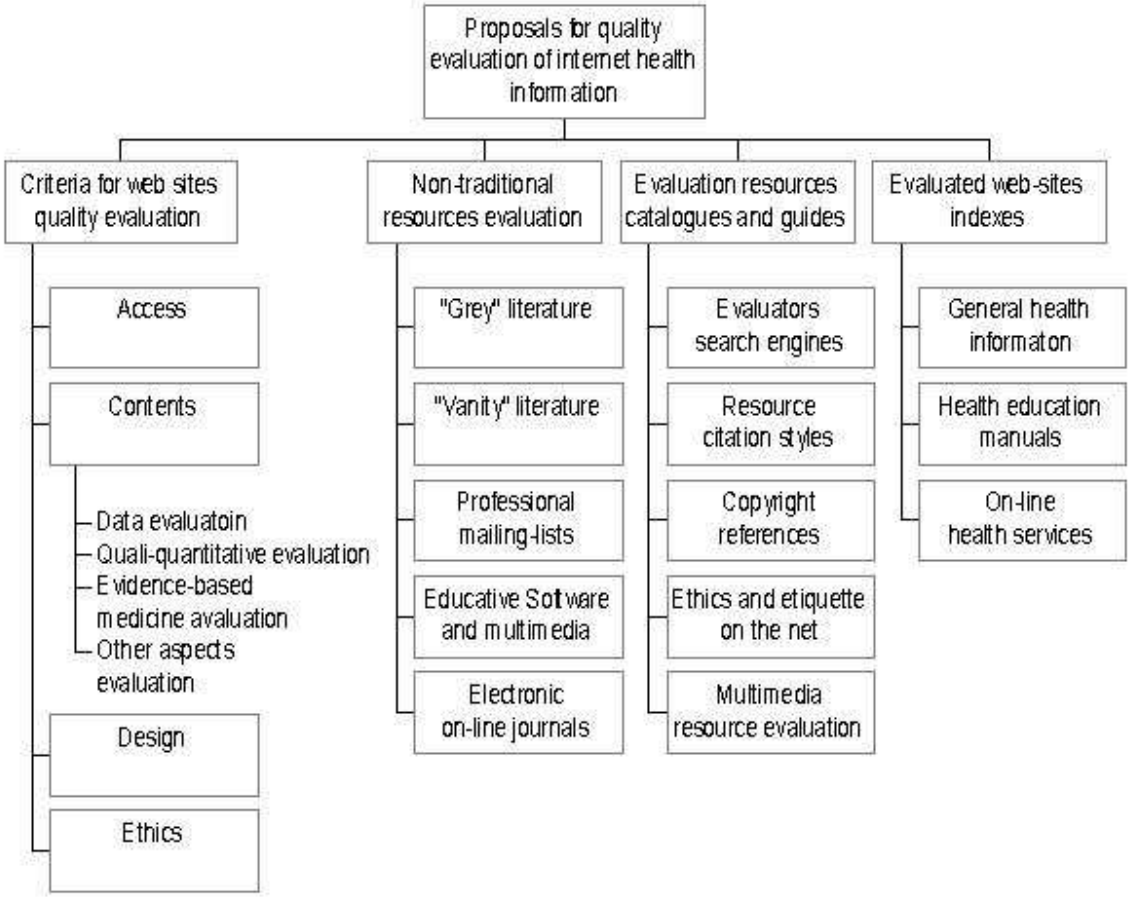

Table 2. Authors that have proposed criteria for quality evaluation

CRITERIO (Caywood)	CATEGORÍA (autor)	INDICADOR	1	2	3	4	5	6	7	8	9	10	11
ACCESO	CONSUMO	Visitas									■		
		Audiencia									■		
	DIFUSIÓN	Comunicados									■		
		Productos Científicos									■		
		De propiedad intelectual									■		
	ACCESIBILIDAD	Limitaciones					■		■			■	
		Costo									■		
		Facilidad de localización			■								
		Facilidad de acceso	■		■							■	
DISEÑO	CONTROL	Evidencia de control de calidad						■					
		Problemas o limitaciones									■		
		Calidad y oportunidad							■	■			
		Facilidad de Mantenimiento			■								
	ORGANIZACIÓN LÓGICA	Navegación					■		■	■	■	■	
		Estructura y organización	■		■	■			■	■		■	
	COMUNICABILIDAD	Legibilidad de texto							■			■	
		Motor de búsqueda interno							■	■	■		
		Traducción							■				
		Calidad de enlaces					■		■	■	■	■	
		Calidad de la redacción							■	■			
		Facilidad para entender el alcance del recurso		■									
	USABILIDAD	Facilidad de uso		■			■			■			
		Carga rápida del sitio					■		■				
		Amigabilidad								■			
		Disponibilidad plena										■	
		Requerimientos especiales de equipo								■			
	ATRACTIBILIDAD	Aspectos estéticos					■						
		Formato y presentación			■					■			
		Diseño gráfico	■										
	INTERACTIVIDAD	Retroalimentación							■	■	■	■	
		Sala de charla							■		■		
		Declaración de algoritmos usados							■		■		
		Valor agregado ofrecido								■			
		Ayuda en línea										■	
	INTENCIONES	Difusión										■	
		Declaración de propósitos							■	■	■		
		Complementariedad hacia otros sistemas											■
		Patrocinio declarado									■		■
		Audiencia						■		■			
		Declaración de usos de la información proporcionada							■				
	CARACTERISTICAS	Descripción de contenidos									■		
		Estabilidad de la información		■	■						■		
		Efectividad						■	■	■	■		
		Originalidad			■					■			
		Precisión y equilibrio					■						
		Identificación y ubicación del autor					■	■	■	■		■	■
		Identificación del recurso					■						
		Vigencia					■						
		Estructura y diseño de información					■						
		Completo						■	■	■	■		
		Objetividad						■					
		Sin falacias ni sesgos						■					
		Corroboración de fuentes						■	■		■		■
		Fecha				■		■			■		■
		Jerarquía de evidencia							■		■		
		Notificación de omisiones						■	■		■		

1 Cayvood. 1995.
2 Tillman. 1995
3 Ciolek. 1997
4 Grossin. 1997
5 Oliver. 1997
6 Harris. 1997
7 Ambre. 1997
8 Smith. 2001
9 HSGG. 1999
10 Lunet al 2000.
11 HON. 2000.

Table 3. Main areas of the instrument for information quality evaluation.

Essential Quality Criteria		
AREA	CATEGORY	INDICATOR
Access and Context	Access	Location and control
		Facility of access
	Context	Credentials
		Actuality
		Consistency
		Evaluation
Design	Organization	Structure
		Organization
	Communicability	Clarity
		Redaction
	Navigability	Navigation
		Friendliness
	Appearance	Aesthetics and format
	Intentions	Declaration

Contents	Conten identification	Stability
		Authorship
		Presition and equilibrium
		Resource identification
		Objectivity
	Credibility	Validity
		Relevance
		Trascendence
		Veracity
	Scientific quality	Review
	Rigths and duties	Rights and privacy
		Security and honesty
		Ethic and alerts
	Links	Access and design
		Contents

Table 4. Example of how questions are presented at the real instrument.

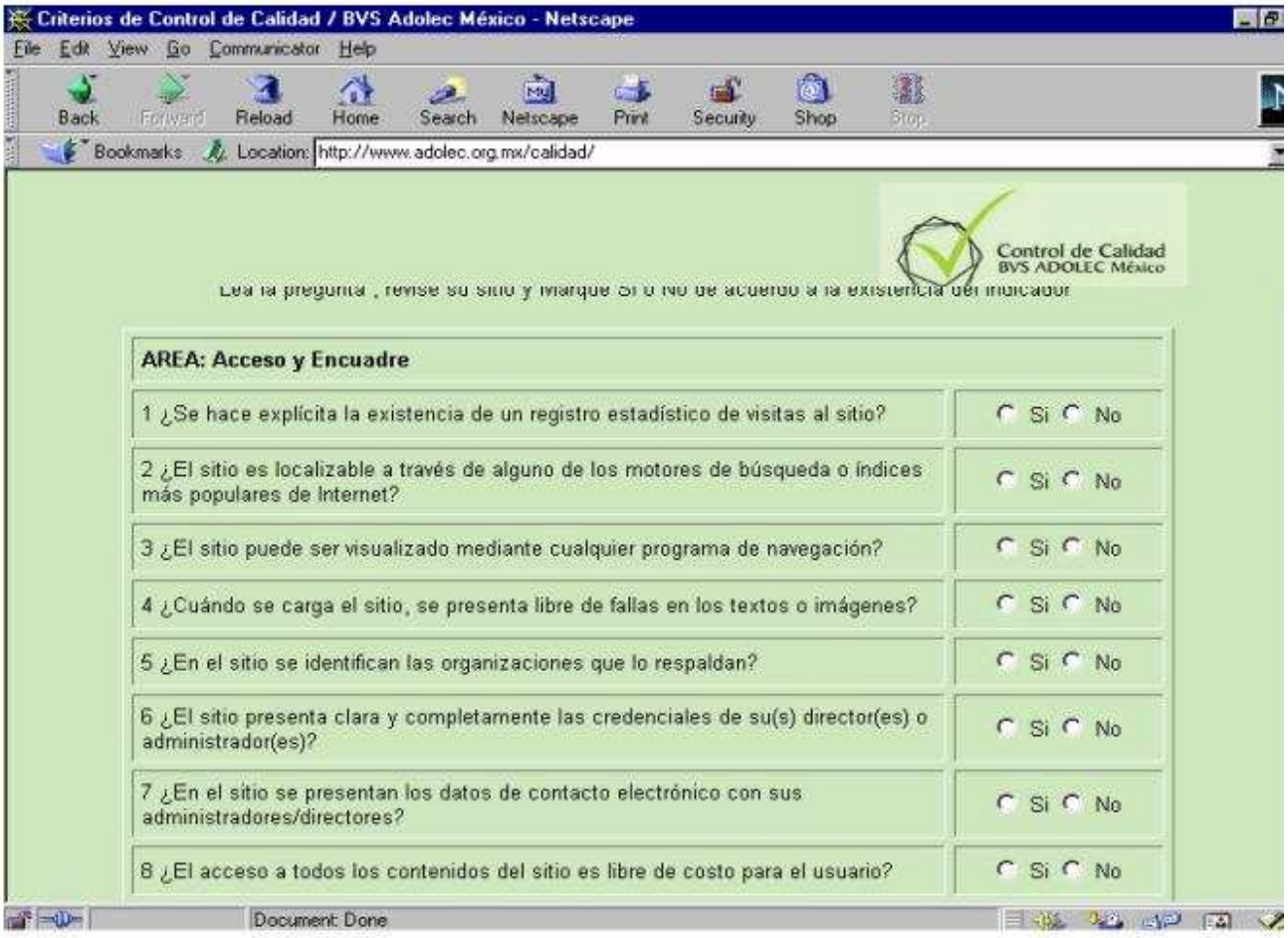

Table 5. Complementary quality criteria.

CRITERIOS ALTERNATIVOS DE CALIDAD					
AREA	CATEGORIA	INDICADOR	#	CRITERIOS	PRESENTE
Acceso	Acceso	Facilidad de acceso	75	¿El sitio está diseñado para que personas con discapacidad puedan tener acceso a sus recursos?	SI O NO O
			76	¿Se informa al usuario cuando el sitio está procesando datos y el tiempo estimado de procesamiento?	SI O NO O
Diseño	Navegabilidad	Amigabilidad	77	¿El sitio ofrece al usuario un motor de búsqueda interno?	SI O NO O
			78	¿Es fácil de usar la interfase del motor de búsqueda interno?	SI O NO O
	Interactividad	Retroalimen-tación	79	Cuándo el usuario envía comentarios, ¿recibe respuesta oportuna?	SI O NO O
			80	Si el sitio ofrece un salón de charla, ¿se ofrece evidencia de que existe un moderador (identificación y experiencia)?	SI O NO O
	Intenciones	Complemen-tariedad hacia otros sistemas	81	¿Se declara si el sitio pretende apoyar y no reemplazar la información de otros sitios o la relación entre usuarios (p. e., médico-paciente)?	SI O NO O
		Patrocinios	82	Cuándo el sitio recibe patrocinios, ¿Son declarados claramente incluyendo la identidad de las organizaciones?	SI O NO O
		Declaración de usos de la información proporcionada	83	Si el sitio solicita información de los usuarios, ¿Se les alerta adecuadamente del uso que se hará de esta información?	SI O NO O
Contenidos	Identificación	Originalidad	84	Si alguna información fue tomada de otro sitio, ¿Se declaran los motivos por los que se hizo así?	SI O NO O
		Presición y equilibrio	85	Si existen contenidos controversiales, ¿Se declaran las posiciones del autor u organización?	SI O NO O

Table 6. Questions in the opinion section of the instrument.