HOSPITAL VIRTUAL LIBRARIES IN LATIN AMERICA AND THE CARIBBEAN: A WEBOMETRIC ANALYSIS

Macías-Chapula, C.A.; Rodea-Castro, I.P.; Mendoza-Guerrero, J.A.; Gutiérrez-Carrasco, A.

Research Unit, Hospital General de México
cesarmch@liceaga.facmed.unam.mx

Keywords: *Hospitals; Virtual/Electronic libraries; Latin America; Caribbean; Information and Communication Technologies; Research; Webometric analysis; Less Developed Countries*

Abstract

Introduction

Information regarding hospital libraries in the United States, Canada and the European Union abounds. Little information however exists in the literature regarding hospital libraries in Latin America and the Caribbean. While new information and communication technologies (*ict*) are being transferred from developed to less developed countries and major emphasis is being placed worldwide on quality of health care, evidence based-medicine, and the use of information on the decision process mechanisms in the delivery of health care, little is known about the capability and empowerment of hospitals in less developed countries to respond to such needs.

Purpose

The purpose of this work is to present the preliminary results of a research in progress on the existing virtual positioning of electronic libraries among hospitals in Latin America and the Caribbean.

Method

A webometric analysis was conducted through the electronic search of those Latin American and Caribbean hospital websites hosting a virtual/electronic library available to their user community via the Internet. The study was limited to a search in Google, HotBot and Yahoo, in 2005. BIREME's Virtual Health Libraries were excluded from the study, considering the available information on the development of this project.

Results

A total of 2,523 hospitals were identified, as reported by 34 Latin American and Caribbean countries. However, only 501(19.85%) hospitals reported an institutional website; 56 (11.18%) stated to have a library; and only 17 (3.39%) owned a virtual/electronic library. These countries were the following in descending order: Mexico, Argentina, and Venezuela.

Discussion

These preliminary results reflect the need to continue this work of research in order to establish a diagnosis of the existing situation in terms of infrastructure and *ict* developments so as to improve the access and use of scientific and technical information among hospitals. The paper discusses both, (1) the important role of BIREME's effort in developing virtual accesses to health libraries in the region and (2) the different implications of this type of research to information providers; end-users; managers and librarians, among others in the health sector.

1. Introduction

The end of the last century was marked by an explosive growth of technology, particularly in electronics, computers, telecommunications, and the Internet. Such development allowed for a number of different Internet services in permanent use up to date; this is the case for example of e-mail, e-market, e-banking, and e-library, to mention only a few. In the health sector, a new paradigm of medical informatics emerged since the mid-70s., when the first medical informatics conference took place in Stockholm, in 1974 (Salamon, et al, 1986). According to Reljin and Strintzis (2001), one of the most attractive and helpful services offered by new information and communication technologies is certainly e-health and telemedicine. Indeed, these technologies provide not only access to information and knowledge to practicing physicians and active researchers, but also to health administrators, social workers, the patient and the community (Velez, et al, 1998; Burkell and Campbell, 2005; Fox, et al, 2005; Illes, et al, 2004; Macías-Chapula, 2001).

Hospitals in developed countries soon incorporated new information and communication technologies into their infrastructure so as to cope with the everyday management and organisation for example, of services, procedures, and statistical data (Greenes et al, 1995; Gunn, 1998; Husk and Waxman, 2004). Integrated hospital information systems were developed (Haugh, 2005; Wright and Katz, 2005; Harrison and Young, 2005; Safran and Detmer, 2005; Nolan, 2005), and virtual hospitals and medical centres emerged where most of the services and administrative transactions are displayed electronically (Courreges, et al, 2005; Meystre, 2005; Duplaga et al, 2004; Ozuah and Reznik, 2004; Wolski, 2004; Effken et al, 2004; Tieman, 2004; Scavuzzo and Gamba, 2004); including the doctor-patient relationship (Annonymous, 2004; Bullard et al, 2004; Booth et al, 2004; Ross et al, 2004). Hospital libraries were not the exception and virtual libraries were extended throughout the United States, Canada and the European Union in an effort to provide fast access to information sources in the place and time demanded by the end user (Rourke et al, 2005; D'Alessandro, et al, 1998; De Groote, 2005; McLeod et al, 2005; Lindberg and Humphreys, 2005; Kabrhel et al, 2005; Kronenfeld, 2005). The social, financial and academic implications of this transformation has been very well documented in the literature (Salamon, 1986; Greenes, 1995; Avgerou, 2000; Barnett, 1994; Ellis, 1991; Bowker et al, 1997) and has encouraged to integrate different types of consortia in order to cope with budget cuts and increased costs (Babish, 2001; Ritchie and Sowter, 2000; Riordan, 1999; Godbolt et al, 1997; Giordano, 2002).

Most of developing countries on the other hand, while aware of new information and communication technologies developments, have not been able to bridge the gap between information access, information use and applications to improve social well being (Avgerou, 1996; Avgerou, 2000; Royaltey, 1988; Saracevic, 1987). The health sector in these countries is still far from filling the information needs of health practitioners, researchers, administrators and patients. In spite of the efforts promoted by the World Health Organisation and local governments, to develop e-health programmes, few and scattered applications have taken place in some countries (Lancet, 2004; WHO, 1999; Wootton et al, 2004; Varghese and Scott, 2004). Practically no research is being conducted

in this field and consequently only few experiences have been published or communicated (Avgerou, 1996, 2000; Macías-Chapula, 1986, 1988, 1995, 2001).
Information regarding hospital libraries in the United States, Canada and the European Union abounds. Little information exists however in the literature regarding hospital libraries in Latin America and the Caribbean (Bonham, 1990; Macías-Chapula, 1995). While some of the new information and communication technologies are being transferred from developed to less developed countries and major emphasis is being placed worldwide on (a) quality of health care; (b) evidence based medicine; and (c) the use of information for medical decision making, little is known about the capability and empowerment of hospitals in less developed countries to respond to such needs.

2. Purpose

The purpose of this work is to present the preliminary results of a research in progress on the existing virtual positioning of electronic libraries among hospitals in Latin America and the Caribbean (LAC). The final goal is to obtain webometric indicators related to virtual hospitals in the LAC regions so as to support managerial decision making on health services provision, R&D collaboration, science policy, social empowerment and e-library consortia.

3. Method

The study was conducted in the following three phases:

1. A pilot study to identify the appropriate search engines and search terms. This was limited to Mexico and the pilot was conducted in November-December, 2004.
2. An Internet search in Google, HotBot and Yahoo to identify hospital websites in 34 LAC countries, both in Spanish and Portuguese. This search was conducted in March-April, 2005.
3. A selection of those hospitals owning a website and holding a virtual library within the LAC regions.

The results of the pilot study were presented in the 1st. Latin American and Caribbean Congress on Hospital Librarianship, in February, 2005 (Macías-Chapula, et al, 2005). As a result of this preliminary exercise, the search engines selected in the second phase were Google, HotBot and Yahoo; and the search terms used were hospital(s), hospitais, clinic(s), medical centre(s), and sanatory(ies). The 34 countries identified were those recognised by the US National Library of Medicine's Medical Subject Headings (MeSH), for the LAC regions. Hospital terms were then intersected to each and every one of the 34 selected countries. This strategy resulted in a list of those LAC hospitals that could be identified through the Internet both, with and without a hospital website.

In the third phase of the study, only hospital websites were listed and classified by country, using Excel (2001). This allowed for a selection of those LAC hospitals that could be searched electronically through their own website. Within each hospital website a further search was conducted to identify the existence of a virtual/electronic library; here, the type

of Internet services, online users and structure was also identified. Figure 1., illustrates the rationale followed in the study.

BIREME's Virtual Health Libraries (BVS) were excluded from the study since the information regarding the overall organisation and development of this programme is well documented in the Internet and among participating LAC countries (PAHO, 1998; OPS, 1999; Packer, 2000; Valdez, 2002; Veiga, 2001). Other organisations excluded from this study corresponded to ministries of health; basic and experimental research and academic institutes along with professional associations and schools and faculties of medicine. The reason being the limitation of the study to those clinical/hospital settings were medical decision making is being supported by electronic information sources. Clearly, those institutions conducting clinical research, and teaching hospitals either private or public, were included in this study.

4. Results

A total of 2,523 LAC hospitals were found through the Internet. Only 501 (19.85%) however reported a website; and 56 (11.18%) stated to own a library, although only 17 (3.39%) reported to hold an electronic library. Ten countries contributed with 2075 (82.24%) referred hospitals through the Internet. These countries were the following in descending order: Mexico (775 hospitals); Brazil (627); Chile (251); Argentina (99); Panama (95); Cuba (66); Venezuela (58); Peru (50); Colombia (30); and Equator (24). This distribution changed however when looking at hospital websites and availability of electronic libraries within each hospital website. Table I provides a distribution of these indicators. Here, we can see that the remaining countries with hospital electronic libraries in descending order were Mexico (9); Brazil (4); Argentina (3); and Venezuela (1). Twelve out of seventeen electronic libraries display their services and structure; and five do not provide access to such services. Table II, describes these findings. Here we find an heterogeneity of services; however, they were mainly related to full text access to books and journals, as well as online access to secondary sources of information, online public access to catalogues (OPACs) and general library holdings.

5. Discussion and conclusion

Developed countries have acquired and applied the new information and communication technologies among their health sectors. This has resulted in the improvement of quality of health care services; the efficient management of health care resources; and the empowerment of health consumers (Korp, 2005; Shaw and Kitzinger, 2005; Gaston and Mitchell, 2005; Sandber et al, 2005; O'cathain et al, 2005; Broom, 2005). Clearly, these elements are closely related to the improvement of quality of life, equity, and social well being. Developing countries, while aware of the difficulties involved in the transference of information technologies since the eighties (Eres and Bivins, 1985; Slamecka, 1985), are still finding it difficult to appropriately incorporate such technologies into their organisations. This is the case of hospitals in the LAC regions. The results of this study while preliminary helped to conclude on the low electronic access to hospital information

and services (less than 12% own a website) and an even lower access to their libraries (less than 5%).

These basic results reflect the need to continue this work of research in order to establish a diagnosis of the existing situation in terms of infrastructure and information and communication technologies developments so as to improve the access and use of scientific and technical information among LAC hospitals. BIREME's role in developing virtual health libraries in the LAC regions is clearly fundamental in orchestrating the political will of LAC governments; health administrators, and local health librarians. Different goals have been met like the creation of the Latin American and Caribbean Health Sciences Literature Database (LILACS) and the Scielo project (PAHO, 1998; Packer, 2001). However, more information is needed in order to learn from these experiences.

Further research needs to be conducted to identify indicators related not only to electronic library developments but also those related for example, to health R&D; continuing medical education; impact on the delivery of health care services; and empowerment of the end user within virtual hospitals in LAC regions. The identification of these indicators can help to improve the activities of the different actors that participate in a health system; mainly medical/paramedical staff; information providers; health managers; librarians and patients. Clearly, information access and use is related to each and every one of these elements. Technologies are being transferred to improve such access. Are we ready to measure improvements of quality of life as derived (among other elements) from the use of new information and communication technologies? The social implications of the results of such research would be, no doubt, tremendous.

6. References

1. Annonymous (2004). Technologies enhance secure doctor-patient communication. Internet Health Strategy., 6 (12):5-8.
2. Avgerou, C.; Walsham, L. (2000). Information technology in context. Studies from the perspective of developing countries. England: Ashgate.
3. Avgerou, C. (1996). Transferability of information technology and organisational practices. In: Global information technology and socioeconomic development. Ed. by Mayuri Odedra-Straub. Ivy League Publishing:New Hampshire, pp.106-115.
4. Babish J.A. (2001). CHI services: consumer health library consortia--a growing trend. Natl Netw, 26(2):9.
5. Barnett, A. (1994). Knowledge transfer and developing countries: the tasks for science and technology in the global perspective 2010. Science and Public Policy, 21(1):2-12.
6. Bonham, M.D. (1990). BIREME: Latin American and Caribbean Health Sciences Information centre. Bulletin of the Medical Library Association, 78(2):119-23.
7. Booth N, et al (2004). Identification of high-quality consultation practice in primary care: the effects of computer use on doctor-patient rapport. Inform Prim Care, 12(2):75-83.
8. Bowker, G.C., et al (1997). Social science, technical systems and cooperative work. Beyond the great divide. Lawrence Erlbaum Associates:NJ/London.

9. Broom, A. (2005). Virtually healthy: the impact of internet use on disease experience and the doctor-patient relationship. Qual Health Res, 15(3):325-45.
10. Bullard M.J, et al, (2004). Supporting clinical practice at the bedside using wireless technology. Acad Emerg Med, 11(11):1186-92.
11. Burkell J; Campbell D.G. (2005). What does this mean? How Web-based consumer health information fails to support information seeking in the pursuit of informed consent for screening test decisions. J Med Libr Assoc, 93(3):363-73.
12. Courreges F; Vieyres P; Istepanian R.S; Arbeille P; Bru C. (2005). Clinical trials and evaluation of a mobile, robotic tele-ultrasound system. J Telemed Telecare. Suppl 1:46-9.
13. D'Alessandro M.P; D'Alessandro D.M; Galvin J.R; Erkonen W.E. (1998). Evaluating overall usage of a digital health sciences library. Bull Med Libr Assoc, 86(4):602-9.
14. De Groote S.L. (2005). Questions asked at the virtual and physical health sciences reference desk: how do they compare and what do they tell us? Med Ref Serv Q. 24(2):11-23.
15. Duplaga M; Soja J; Cala J; Leszczuk M; Wasowski D; Sladek K; Zielinski K. (2004). The impact of teleconsultations at a referential centre on the management of pulmonary patients. Stud Health Technol Inform, 105:92-9.
16. Effken J.A; Brewer B.B; Patil A; Lamb G.S; Verran JA; Carley K. (2004). Using computational modeling to improve patient care unit safety and quality outcomes. Medinfo. 2004;11(Pt 1):726-30.
17. Ellis, L.S. (1991). The establishment of an academic health sciences library in a developing country: a case study. Bulletin of the Medical Library Association, 79(3):295-301.
18. Eres, B.K., et al (1985). Access to primary and secondary literature from peripheral or less developed countries. J Am Soc Inf Sci, 36(3):184-91
19. Fox N.J; Ward K.J; O'Rourke A.J. (2005). The 'expert patient': empowerment or medical dominance? The case of weight loss, pharmaceutical drugs and the Internet. Soc Sci Med. 60(6):1299-309.
20. Gaston, C.M.; Mitchell, G. (2005). Information giving and decision-making in patients with advanced cancer: A systematic review. Soc Sci Med (Epub ahead of print)
21. Giordano, T. (2002). Library Consortium Models in Europe: a Comparative Analysis. Alexandría, 14(1): 41-52.
22. Godbolt S; Williamson J; Wilson A. (1997). From vision to reality--managing change in the provision of library and information services to nurses, midwives, health visitors and
23. PAMs: (professions allied to medicine) a case study of the North Thames experience with the Inner London Consortium. Health Libr Rev. 14(2):73-95.
24. Greenes, R.; Peterson, H.E.; Protti, D.J. (1995). Medinfo'95. Proceedings of the Eighth World Congress on Medical Informatics. Vancouver: North-Holland.
25. Gunn I.P. (1998). A critique of Michael L. Millenson's book, Demanding medical excellence: doctors and accountability in the information age, and its relevance to CRNAs and nursing. AANA J. 66(6):575-82.
26. Harrison M.I; Young S. (2005). Computers and clinical work. JAMA. 294(2):181

27. Haugh R. (2005). Seeking a return. Hospitals make the case for IT investment. Hosp Health Netw. 79(6):37.
28. Husk G; Waxman D.A. (2004). Using data from hospital information systems to improve emergency department care. Acad Emerg Med. 11(11):1237-44.
29. Illes J; Kann D; Karetsky K; Letourneau P; Raffin T.A; Schraedley-Desmond P; Koenig B.A; Atlas S.W. (2004). Advertising, patient decision making, and self-referral for computed tomographic and magnetic resonance imaging. Arch Intern Med. 164(22):2415-9.
30. Kabrhel C; Liu S; Takayesu J.K; Thomas S.H. (2005). Creation of an online collection of emergency medicine literature. Acad Emerg Med. 12(2):173-5.
31. Korp, P. (2005). Health on the Internet: implications for health promotion. Health Educ Res (Epub ahead of print).
32. Kronenfeld MR. (2005). Trends in academic health sciences libraries and their emergence as the "knowledge nexus" for their academic health centers. J Med Libr Assoc., 93(1):32-9.
33. Lancet (2004) Mexico, 2004: Global health needs a new research agenda. The Lancet. 364(9445):1555-1556.
34. Lindberg D.A; Humphreys B.L. (2005). 2015--the future of medical libraries. N Engl J Med., 352(11):1067-70.
35. Macías-Chapula, C.A.; Rodea-Castro, I.P. (2005). Internet access to hospital libraries in Mexico. Paper presented at the First Latin American and Caribbean Congress on Hospital Libraries. Hospital General de México: Mexico, D.F.
36. Macías-Chapula, C.A. (2001) Implementation of a hospital library automation project in Mexico: Learning from experience. Electronic Journal on Information Systems in Developing Countries (EJISDC) 5,6:1-12.
37. Macías-Chapula, C.A. (1997). An approach to identifying the role of information in a health care system: implications for the quality of health. In: Social science, technical systems and cooperative work. Beyond the great divide. Ed. By Geoffrey C. Bowker, et al. Lawrence Erlbaum associates:NJ/London, pp.275-291.
38. Macías-Chapula, C.A. (1995). A descriptive study of ninety-two hospital libraries in Mexico. Bulletin of the Medical Library Association, 83(1):66-70.
39. Macías-Chapula, C.A. (1988). Analysis of the use of MEDLARS in Mexico. Bulletin of the Medical Library Association, 76(4):334-38.
40. Macías-Chapula, C.A. (1986). Mexico's National Biomedical Bibliography: a proposal for the setting-up of a computer-based indexing system. Medical Informatics (London), 11(3):259-67.
41. McLeod L; Thain A; Wales A. (2005). Influence of strategic direction for NHS Scotland knowledge services on indexing policy for the NHS Scotland e-library. Health Info Libr J. 22(1):44-53.
42. Meystre S. (2005). The current state of telemonitoring: a comment on the literature. Telemed J E Health. 11(1):63-9.
43. Nolan, A. (2005). Technology. Positive image. Health Serv J. 115(5961):suppl 5.
44. O'cathain, A., et al, (2005). Does NHS Direct empower patients? Soc Sci Med, 61(8):1761-71.
45. Organización Panamericana de la Salud. (1999). Biblioteca virtual en salud / Virtual health library. Washington, D.C; Organización Panamericana de la Salud.

46. Ozuah P.O: Reznik M. (2004). The role of telemedicine in the care of children in under-served communities. J Telemed Telecare. Suppl 1:78-80.
47. Packer, A. L. (2001). The SciELO Model for electronic publishing and measuring of usage and impact of Latin American and Caribbean scientific journals. In: Second Icsu-Unesco International Conference electronic publishing in science. Paris: Unesco.
48. Packer A. (2000). The Virtual Health Library and the remodelling of the health scientific and technical information flow in Latin America and the Caribbean. PAHO:Washington.
49. PAHO, (1998). BIREME and the Latin American and Caribbean System on Health Sciences Information: toward the virtual health library. PAHO:Washington.
50. Reljin B.; Atrintzis M. (2001). The concept of Virtual Medical Center. Annals of the Academy of Studenica. 4: 45-52.
51. Riordan M.L; Perry G.J. (1999). Interlibrary cooperation: from ILL to IAIMS and beyond.
Bull Med Libr Assoc.,87(3):251-5.
52. Ritchie A; Sowter B. (2000). Availability and accessibility of evidence-based information resources provided by medical libraries in Australia. Aust Health Rev. 23(1):77-89.
53. Ross S.E; Moore L.A; Earnest M.A; Wittevrongel L; Lin C.T. (2004). Providing a web-based online medical record with electronic communication capabilities to patients with congestive heart failure: randomized trial. J Med Internet Res., 6(2):12.
54. Rourke D; Samsundar D.R; Shalini C. (2005). Author! author!: creating a digital archive of publications in a hospital library setting. Med Ref Serv Q., 24(2):87-93.
55. Royaltey, H.H. (1988). The information needs of health care professionals and consumers in developing countries. Bulletin of the Medical Library Association, 76(1):35-43.
56. Safran C; Detmer D.E. (2005). Computerized physician order entry systems and medication errors. JAMA., 294(2):179.
57. Salamon R.; Blum B. (1986). Medinfo'86. Proceedings of the Fifth Conference on Medical Informatics. Washington: North-Holland.
58. Sandberg, K.W., et al, (2005). The use of information and communication technology (ICT) in the rehabilitation of individuals with severe functional impairments in a municipal care service system. Work, 24(3):229-38.
59. Saracevic, T. (1988). Selective medical library on microfiche. An international experiment supported by the Rockefeller Foundation. Bulletin of the Medical Library Association, 76(1):44-53.
60. Scavuzzo J; Gamba N. (2004). Bridging the gap: the Virtual Chemotherapy Unit. J Pediatr Oncol Nurs., 21(1):27-32.
61. Shaw, R.; Kitzinger, C. (2005). Calls to a home birth helpline: Empowerment on childbirth. Soc Sci Med (Epub ahead of print)
62. Slamecka, J. (1985) Information technology and the third world. J Am Soc Inf Sci, 36(3):178-83.
63. Tieman J. (2004). Virtual moves. 121 hospitals approved for wage reclassification. Mod Healthc. 34(17):10.

64. Valdes A. (2002). [The virtual library in equity, health, and human development] Rev Panam Salud Publica., 11(5-6):462-5. Review. Spanish.
65. Varghese, S.; Scott, R.E. (2004). Categorizing the telehealth policy response of countries and their implications for complementarity of telehealth policy. Telemed J E Health 10(1):61-9.
66. Veiga de Cabo J. (2001). [The Virtual Health Library (BVS): a bet for the dissemination of Spanish and Latin American scientific production in collaboration with the PAHO/WHO] Rev Esp Salud Publica., 75(4):277-80. Spanish.
67. Velez M.; Martinez Y.; Reyes J. (1998). Internet for internists. Clin. Med. H.C.C. 3(1):60-64.
68. WHO (1999) Global Forum on Health Research. The 10/90 report on health research 1999. Geneve: World Health Organisation.
69. Wolski, C.A. (2004). Get real. A virtual rehabilitation technology. Rehab Manag., 17(9):14, 16-7.
70. Wootton, R., et al (2004). Prospective case review of a global e-health system for doctors in developing countries. J Telemed Telecare, 10 Suppl 1:94-6.
71. Wright A.A; Katz I.T. (2005). Bar coding for patient safety. N Engl J Med., 353(4):329-31.

Table I.
Hospital virtual libraries in Latin America and the Caribbean. Distribution by main participating countries (Google, HotBot, and Yahoo; March-April, 2005).

r	**Countries**	**No. of hospitals**	**No. of web sites**	**No. of libraries**	**No. of Virtual libraries**
1	Mexico	775	114	22	9
2	Brazil	627	157	14	4
3	Chile	251	43	3	
4	Argentina	99	26	7	3
5	Panama	95	16	1	
6	Cuba	66	25	1	
7	Venezuela	58	28	1	1
8	Peru	50	40	3	
9	Colombia	30	18	2	
10	Equator	24	9	2	
	TOTAL	**2075**	**476**	**56**	**17**

Table II.

Hospital virtual libraries services in Latin American and the Caribbean (2005).

Code N°	Institution with VML	countries	Services														
			DBs	BioColl	DNML	VHL	CGO	Med.D	EE / D	Phar.I	EBM	MDc	I.Path	CME	EJ	LL	OPAC	BTS
1	Hosp. Aleman	Argentina													X	X		
2	Hosp. Italian of Buenos Aires	Argentina													X			X
3	National Hosp. Dr. A.Posadas	Argentina													X			
4	Hosp. Virtual Brasileiro	Brasil						X							X	X	X	X
5	Private Hosp. of Hermosillo	Mexico							X				X					
6	National Institute of Perinatology	Mexico	X		X		X			X				X				
7	Mexico General Hosp.	Mexico	X					X	X		X	X			X			X
8	National Institud of Pediatric	Mexico	X			X		X	X	X				X	X			
9	Hosp. Juarez of Mexico	Mexico	X		X				X					X				
10	Medica Sur	Mexico		X						X		X						
11	CENAIDS - IMSS	Mexico													X			
12	Centre Med. The Trinidad	Venezuela	X												X		X	X
13	INCMN Salvador Zubirán	Mexico																
14	Pediatric Private Hosp.	Mexico																
15	Hosp. of Saint Antonio	Brazil																
16	Hosp. Monte Sinai	Brazil																
17	Hosp. Moinhos of Vento, Porto A.	Brazil																

Key

1	DBs	Databases
2	BioColl	Biomedical Collection
3	DNML	Digital National Medical Library
4	VHL	Virtual Health Library
5	CGO	Conferences of Gynecology and Obstetrics
6	Med D	Medical Links Directions
7	EE / D	Electronic Encyclopedia / Dictionaries
8	Far.I	Pharmacological Information
9	EBM	Evidence Based Medicine
10	MDc	MDConsult
11	I.Path	Information services in Pathology
12	CME	Contining Medical Education
13	EJ	Electronic journals
14	LL	Links to libraries
15	OPAC	Online Public Access Catalogue
16	BTS	Books, Thesis, Serials

Web Site according to Code N°

1	www.hospitalaleman.com .ar
2	www.hitalba.edu .ar
3	www.hospitalposadas.org .ar
4	www.hospit .org.br/
5	www.hermosillovirtual.com
6	www.facmed.unam .mx/inper
7	www.hgm.salud. com
8	www.pediatria. gob.mx
9	www.facmed.unam .mx/hjm/
10	www.medicasur. com.mx
11	http://edumed.imss. gob.mx
12	www.cmdlt.edu. Ve
13	www.innsz. Mx
14	www.hip.com .mx/
14	http://.hospitalsantoantonio.vilabol.uol.com. br
16	www.hospitalmontesimnai .com.br/
17	www. hmv.org.br

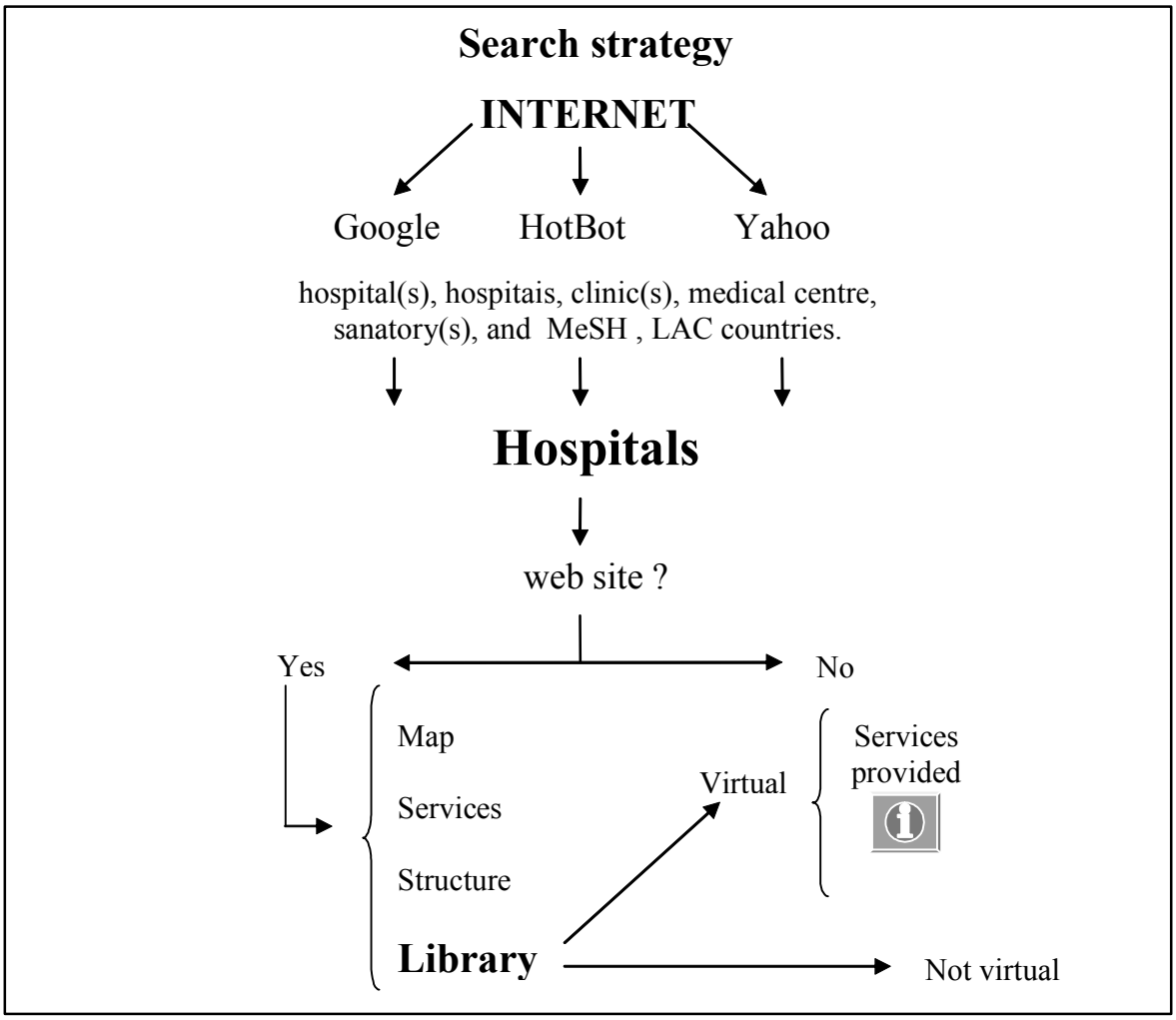

Figure 1. Rationale followed to identify hospital virtual libraries in Latin American and Caribbean countries (2005).