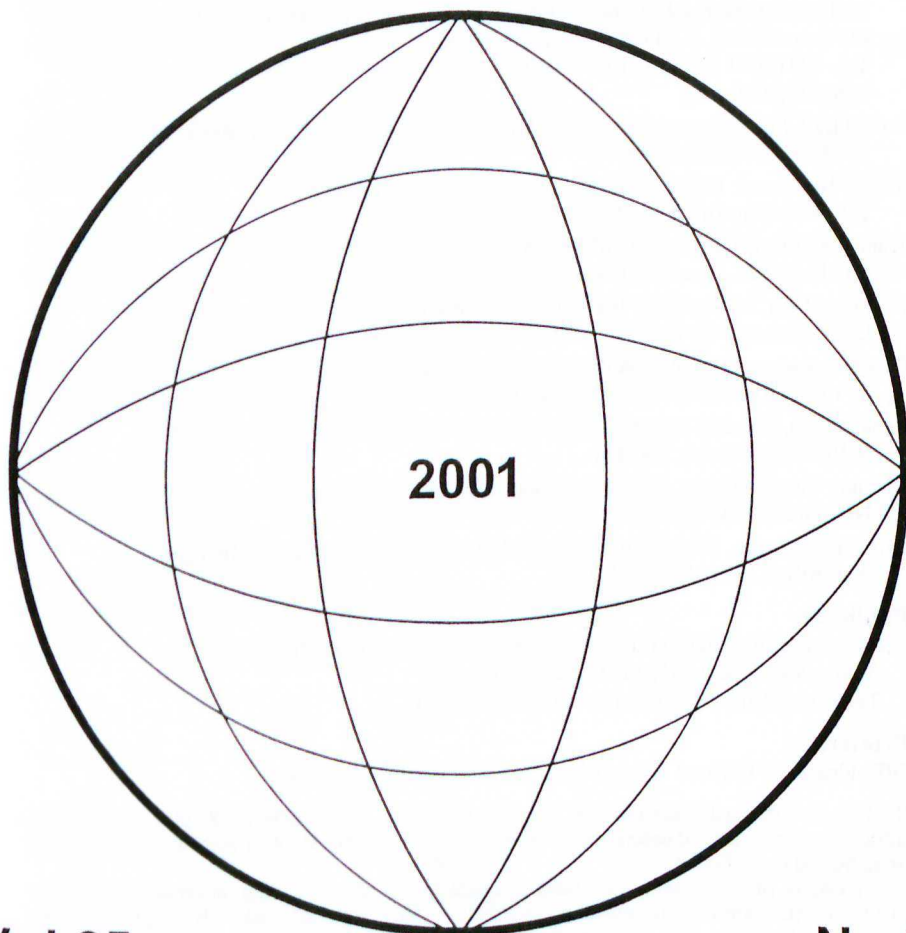


INSPEL



Vol.35

No.3

Official Organ of the IFLA Division of Special Libraries

INTERNATIONAL JOURNAL OF SPECIAL LIBRARIES
REVUE INTERNATIONALE DES BIBLIOTHEQUES SPECIALISEES
МЕЖДУНАРОДНЫЙ ЖУРНАЛ СПЕЦИАЛЬНЫХ БИБЛИОТЕК
INTERNATIONALE ZEITSCHRIFT FÜR SPEZIALBIBLIOTHEKEN
REVISTA INTERNACIONAL PARA BIBLIOTECAS ESPECIALES

Published in cooperation with the German Special Libraries Association
(Arbeitsgemeinschaft der Spezialbibliotheken - ASpB)

Editorial Board:

Hans-Christoph Hobohm (Editor in chief)

Fachbereich Archiv-Bibliothek-Dokumentation, Fachhochschule Potsdam,
PO-Box 600608, D-14406 Potsdam, Germany.

Tel.: +49 (0)331 580 1514, Fax: +49 (0)331 580 1599; e-mail: Hobohm@FH-Potsdam.de
<http://inspel.ifla.org>

Rafael Ball, Forschungszentrum Jülich GmbH, Zentralbibliothek, Leo-Brandt-Strasse
D-52425 Jülich, Germany

Ysabel Bertolucci, Kaiser Permanente Medical Center, Library
280 West MacArthur Blvd., Oakland, CA 94611, USA

Jeannette Dixon, The Museum of Fine Arts
P.O.Box 6826, Houston, Texas 77265-6826, USA

Paul Kaegbein, Lehrstuhl für Bibliothekswissenschaft der Universität zu Köln,
Universitätsstr. 33, D-50931 Köln, Germany

Olivier Loiseaux, Bibliothèque Nationale de France
58 rue de Richelieu, F-75084 Paris Cedex 02, France

Lena Olsson, Swedish Government Library, Government Central Services Office
S-10333 Stockholm, Sweden

Myoung Chung Wilson, Alexander Library, Rutgers - The State University of New Jersey,
New Brunswick, N.J. 08903, USA

Patricia B. Yocum, 3026 Shapiro Science Library, The University of Michigan
Ann Arbor, MI 48109-1185, USA

Publisher:

Technische Universität Berlin, Universitätsbibliothek, Abt. Publikationen,
Straße des 17. Juni 135, 10623 Berlin, Germany
Telefon: (030) 314-23980, Fax: (030) 314-24741

Printer:

Offsetdruckerei Gerhard Weinert GmbH, 12099 Berlin, Germany

INSPEL is published quarterly. The annual subscription rate is DM 80,00 plus postage. All subscription inquiries and orders should be sent to the Publisher. All other correspondence should be addressed to the Editor.

The contents of this journal are indexed/abstracted in the following information services: ECONIS (Economics Information System), IBZ (Internationale Bibliographie der Zeitschriftenliteratur), ISA (Information Science Abstracts and Fulltext Sources Online), INFODATA (Informationswissenschaft und -praxis), Library Literature & Information Science Full Text, LISA (Library and Information Science Abstracts).

© INSPEL and contributors

ISSN 0019-0217

Contents:

Weiyu Fan:

The Traditional Chinese Medical Literature Analysis and Retrieval System (TCMLARS) and Its Application.

147 AR

Arlene Cohen, Claire Hamasu, Irene M Lovas:

Innovations in Networking to Provide Electronic Delivery of Documents to Health Professionals in the Western Pacific.

157 AR

Lois Ann Colaianni:

Making Stone Soup: library cooperation - a professional responsibility or necessity?

166

Azra Qureshi, M. Khurshid Alam, Syed Ahmed Naqvi:

Using Technology for Disseminating Information in Pakistani Medical Colleges.

172 AR

Ribes Cot, García Martín, Rodríguez del Castillo Martín:

Collaboration Among Spanish Medical Libraries.

183 R

Mary W. Wood and Lynette A. Hart:

Searching for the 3Rs: Facilitating Compliance in the Bibliographic Search for Alternatives.

191 AR

Harvey Brenneise:

Creating a State-Wide Virtual Health Library: The Michigan Experience.

199 AR

Rüdiger Schneemann:

Online Technology or CD ROM: Which One Will Make It?

209 R

THE TRADITIONAL CHINESE MEDICAL LITERATURE ANALYSIS AND RETRIEVAL SYSTEM (TCMLARS) AND ITS APPLICATION*

By Weiyu Fan

Abstract: The Traditional Chinese Medical Literature Analysis and Retrieval System TCMLARS is a database system established by the Institute of Information on Traditional Chinese Medicine, China Academy of Traditional Chinese Medicine, to meet the increased need for traditional Chinese medical information services in the 1980's. The system contained over 340,000 references and abstracts to literature on Traditional Chinese Medicine including Chinese materia medica, acupuncture, qigong, Chinese massage and health promotion. Source material for TCMLARS is drawn from more than 800 Chinese biomedical journals published since 1984. Over 30,000 records are added to the system annually. There are 15 databases in the system, 4 of which include both Chinese and English versions. Extensive indexing according to *Chinese Traditional Medicine and Materia Medica Subject Headings* and *Medical Subject Headings* (MeSH) is done for each citation. Information can be searched from almost all of the fields including title, author, author affiliation, subject headings, key words, classification, publication type, and abstract. The database system is available via website (<http://www.cintcm.com>, <http://www.cintcm.ac.cn>, <http://www.sinomd.com>), or CD-ROM or floppy disk. A bibliometric study reviewing the traditional Chinese medical literature on neoplasm was conducted using TCMLARS. 10,185 references were pulled up from the databases (1984-1998) by the subject heading "neoplasms". For advanced searches, the following subheadings were used: traditional Chinese drug therapy, acupuncture-moxibustion therapy, qigong therapy, massage therapy, acupoint therapy, integrated Chinese traditional and Western medicine therapy. Further analyses were performed on neoplasm type, year of publication, author's organizational affiliation, type of literature, and the research grant. This study clearly outlines the extent of clinical work and research on neoplasms treated by Traditional Chinese Medicine in China. TCMLARS is proving to be the most efficient and effective means of literature retrieval and analysis for Traditional Chinese Medicine in the world.

Keywords: Literature Database, Traditional Chinese Medicine, Neoplasms, Bibliometrics

Introduction

For thousands of years, Traditional Chinese Medicine (TCM) has provided a system of health care for the Chinese. In recent decades, more and more people

* This paper was presented at the 8th International Congress of Medical Librarianship held in London, July 2000.

pay attention to Traditional Chinese Medicine since it is natural, has less side-effects, and most of all, is effective for some patients who can not be cured by conventional medicine. According to statistics from 1998 compiled by the Chinese government, there are 2,629 traditional Chinese medical hospitals, nearly 300 traditional Chinese medical clinics and over 350,000 TCM doctors in the whole country. TCM clinics and schools have now been established in most countries and regions in the world.^[1] With the advance of experimental research and clinical studies, the amount of TCM literature is increasing rapidly. The need for information services is growing dramatically. However, MEDLINE, the largest biomedical bibliographic database in the world, and other famous medical bibliographic databases, such as EMBASE or BIOSIS, index only a few traditional Chinese medical journals. The number of articles about Traditional Chinese Medicine in these databases is much smaller than what is actually published in China and other countries. For instance, less than 900 citations could be searched from MEDLINE in 1991 by using the subject headings “Medicine, Chinese Traditional”, “Acupuncture” or “Drugs, Chinese Herbal”, while more than 17,900 journal articles on those topics were published in China this year. In response to the increasing demand for Traditional Chinese Medicine information by clinical practitioners, researchers, teaching professionals and students, the Traditional Chinese Medical Literature Analysis and Retrieval System TCMLARS , a bibliographic database, was developed and established by the Institute of Information on Traditional Chinese Medicine, China Academy of Traditional Chinese Medicine in the 1980’s. Thousands of online searches are done each year. This paper details a bibliometric study of the traditional Chinese medical literature on neoplasm retrieved from TCMLARS.

Methodology

TCMLARS

Coverage

Until March 1, 2000, TCMLARS, the Traditional Chinese Medical Literature Analysis and Retrieval System contained over 337,100 references and abstracts to literature on Traditional Chinese Medicine, including Chinese materia medica, acupuncture, qigong, Chinese massage, health promotion, and other topics. The source material for TCMLARS is drawn from more than 800 Chinese biomedical journals published in China since 1984, of which over 100 are speciality periodicals in Traditional Chinese Medicine. More than 30,000 records are added to the system annually. There are 15 databases in the system, consisting of the Chinese Medical History Database (TCMHIST), Chinese Materia Medica Database (HERBLINE) Acupuncture-Moxibustion Literature Analysis and

Retrieval Database (ACULARS), TCM Clinical Trials Database (TCMTRIAL), AIDS Database (AIDSHERBS), Cancer Database (TCMCANCER) STD and Sexual Disorder Database (TCMSEXLINE), Geriatrics Database (TCMGERIAT), TCM Physician Query Database (TCMPHYSICIAN), Chemical Compounds of Chinese Drug Database (TCDCHEMLINE), Chinese Pharmacology Database (TCDPHARMACOL), Experiences of Famous TCM Doctor Database (FAMDOCTEXPER), TCM Research Project Database (TCMPROJ), Traditional Chinese Medical Abstract Database (TCMABST), and TCM Periodical Database (TCMPERIOD). The Acupuncture-Moxibustion Literature Analysis and Retrieval Database, Chinese Materia Medica Database, Chemical Compounds of Chinese Drug Database, and Chinese Pharmacology Database have both Chinese and English versions.

INDEXING

Descriptor language is adopted in indexing. *Chinese Traditional Medicine and Materia Medica Subject Headings* ^[2] and *Medical Subject Headings* (MeSH) ^[3] are used as the thesauri. In general, MEDLARS indexing principles and the MeSH thesaurus created by the National Library of Medicine in the United States have been proved to be successful and efficient in medical literature indexing. However, MeSH is not adequate for indexing Chinese medical literature, for it contains only a few subject headings about Traditional Chinese Medicine, and the subheadings in MeSH can not meet the special requirements for indexing TCM articles. Therefore, a special thesaurus was compiled for TCMLARS. *Chinese Traditional Medicine and Materia Medica Subject Headings* contains 5,806 medical headings representing TCM concepts and 93 subheadings (including 11 TCM subheadings and 82 MeSH subheadings)

The policies and rules of MEDLARS ^[4] are followed in analyzing and indexing journal articles for TCMLARS. Guidelines for the indexing of traditional Chinese medical literature ^[5] are also followed. MeSH subject headings are selected first when doing indexing. If there is no suitable MeSH heading for indexing the particular TCM concept, then *Chinese Traditional Medicine and Materia Medica Subject Headings* are used. In addition to using 82 subheadings from MeSH, another 11 subheadings are added when indexing. These are: /traditional Chinese medical therapy, /traditional Chinese drug therapy, /acupuncture-moxibustion therapy, /qigong therapy, /massage therapy, /acupoint therapy, /integrated Chinese traditional and Western medicine therapy, /acupuncture-moxibustion effects, /qigong effects, /pathogenesis (TCM), and /production and preparation.

HARDWARE AND SOFTWARE

The system was initially run on an IBM PC/XT and AT with MICRO CDS/ISIS information retrieval software developed by UNESCO, then on a VAX 4500 minicomputer with TRIP software. Now the software, ORACLE, is installed to run TCMLARS.

SEARCH CAPABILITIES

There are 30 categories of information for each citation in TCMLARS. Information can be searched from almost all fields including title, author, author affiliation, subject headings, key words, classification, publication type, journal sources, publication year, and abstract. The database system is available via website (<http://www.cintcm.com>, <http://www.cintcm.ac.cn>, <http://www.sinomd.com>), or CD-ROM or floppy disk.

BIBLIOMETRIC STUDY

A bibliometric study was performed based on TCMLARS. 10,185 references were searched from the databases from 1984 to 1998 using the subject heading "neoplasms". For advanced searches the following subheadings were used: /traditional Chinese drug therapy, /acupuncture-moxibustion therapy, /qigong therapy, /massage therapy, /acupoint therapy, and /integrated Chinese traditional and Western medicine therapy. Further analyses were performed on neoplasm type, published year of the articles, author's organizational affiliation, type of literature, and the research grant.

Results

Articles Published Each Year

The search results show the number of articles published each year on neoplasms treated by Traditional Chinese Medicine, as well as the percent of articles on neoplasm in the system for every year is increasing. (See Table 1.)

Table 1 Articles Published Each Year

Published Year	Total Articles	Articles on Neoplasm	% of Total
1984	11,405	273	2.39
1985	14,477	296	2.04
1986	15,446	305	1.97
1987	16,264	362	2.22
1988	16,898	411	2.44
1989	16,112	391	2.43
1990	17,036	524	3.08
1991	17,921	570	3.18
1992	19,390	645	3.33
1993	19,942	711	3.57
1994	22,262	802	3.60
1995	26,702	809	3.03
1996	31,033	1,081	3.48
1997	33,470	1,339	4.00
1998	37,736	1,666	4.41
Total	316,094	10,185	3.22

Classification of Articles on Neoplasms

Among the 10,185 neoplasm references searched from the databases for the years 1984 to 1998, 7,101 (69.72%) are about clinical studies, and 5,296 (74.58%) of these are about traditional Chinese therapies. (See Table 2 and 3.)

Table 2 Classification of Articles on Neoplasms

	Clinical Studies	Experimental Studies	Reviews	Historical	Others	Total
Articles	7,101	2,079	902	67	36	10,185
% of Total	69.72	20.41	8.86	0.66	0.35	100

Table 3 Classification of Articles on Clinical Study on Neoplasms

	TCM Therapies	Other Therapies	Diagnosis	Nursing	Total
Articles	5,296	1,075	616	114	7,101
% of Total	74.58	15.14	8.67	1.61	100

Kinds of Neoplasms Treated by TCM Therapies

Analysis of the 5,296 articles on neoplasms treated by traditional Chinese therapies shows that more than 30 types of neoplasms were treated. Neoplasms with greatest coverage in the Chinese medical literature included lung neoplasm, stomach neoplasm, liver neoplasm, esophageal neoplasm, breast neoplasm, thyroid

neoplasm, nasopharyngeal neoplasms, brain neoplasm, Leukemia, and rectal neoplasm. (See Table 4.)

Table 4. Kinds of Neoplasms Treated by TCM Therapies

Neoplasms	Articles	% of Total
Lung neoplasms	823	15.54
Stomach neoplasms	796	15.03
Liver neoplasms	783	14.79
Esophageal neoplasms	483	9.12
Breast neoplasms	278	5.25
Thyroid neoplasms	180	3.41
Nasopharyngeal neoplasms	178	3.36
Brain neoplasms	148	2.80
Leukemia	133	2.51
Rectal neoplasms	132	2.49
Colonic neoplasms	124	2.34
Cervix neoplasms	86	1.62
Lymphoma	72	1.36
Laryngeal neoplasms	70	1.32
Bone neoplasms	67	1.27
Ovarian neoplasms	67	1.27
Pancreatic neoplasms	67	1.27
Bladder neoplasms	60	1.13
Skin neoplasms	43	0.81
Penile neoplasms	25	0.47
Kidney neoplasms	24	0.45
Prostatic neoplasms	23	0.43
Tongue neoplasms	23	0.43
Vaginal neoplasms	13	0.25
Eye neoplasms	6	0.11
Fallopian tube neoplasms	6	0.11
Choriocarcinoma	4	0.07
Testicular neoplasms	4	0.07
Mouth neoplasms	3	0.06
Bile duct neoplasms	2	0.04
Urethral neoplasms	2	0.04
Others	571	10.78
Total	5,296	100

Traditional Chinese Therapies Used for Neoplasms

In the 5,296 articles on neoplasms treated by traditional Chinese therapies, 3,765 (71.09%) are involved traditional Chinese drug therapy, 945 (17.84%) integrated Chinese traditional and western medicine therapy, 278 (5.25%) qigong therapy, 201 (3.80%) acupuncture-moxibustion therapy, 100 (1.89%) acupoint therapy, and 7 (0.13%) Chinese massage therapy. (See Table 5.)

Table 5 Traditional Chinese Therapies used for Neoplasms

Therapies	Articles	% of Total
Traditional Chinese Drug	3,765	71.09
Integrated Chinese Traditional and Western Medicine	945	17.84
Acupuncture-moxibustion	278	5.25
Qigong	201	3.80
Acupoint	100	1.89
Massage	7	0.13
Total	5,296	100

Distribution of Authors of Articles on Neoplasm

The distribution of authors of articles on neoplasm is shown in Tables 6 and 7. From Table 6 we can see that most of the authors work for hospitals and clinics, then medical schools, research institutes, military institutions, and others institutions. Table 7 indicates that the highest number of authors come from Jiangsu, Beijing, Shanghai, Shandong and Zhejiang, which all are the economically and culturally developed area in Mainland China.

Table 6. Distribution of Authors of Articles on Neoplasm (by organizational affiliation)

Organizational affiliation	Articles	% of Total
Hospitals and Clinics	5,859	57.53
Medical schools	2,239	21.98
Research institutes	1,227	12.05
Military institutions & hospitals	471	4.62
Others	389	3.82
Total	10,185	100

Table 7. Distribution of Authors of Articles on Neoplasm (by area)

Area	Articles	% of Total
Jiangsu	837	8.22
Beijing	791	7.77
Shanghai	702	6.89
Shandong	626	6.15
Zhejiang	590	5.79
Guangdong	507	4.98
Henan	489	4.80
Military	471	4.62
Hebie	438	4.30
Sichuan	311	3.05
Hubei	295	2.90
Shaanxi	294	2.89
Fujian	277	2.72
Hunan	264	2.59
Anhui	258	2.53
Liaoning	223	2.19
Jilin	204	2.00
Shanxi	202	1.98
Heilongjiang	195	1.91
Tianjin	188	1.85
Jiangxi	162	1.59
Gansu	129	1.27
Guangxi	125	1.23
Yunnan	90	0.88
Guizhou	90	0.88
Inner Mongolia	68	0.67
Chongqing	61	0.60
Xinjiang	50	0.49
Qinghai	26	0.26
Ningxia	24	0.24
Hainan	9	0.09
Hongkong	5	0.05
Taiwan	3	0.03
Other Countries	1,181	11.59
Total	10,185	100

Research Grants

Among the 10,185 citations on neoplasms searched from the database system, 251 authors indicate that their studies are sponsored by grants. Details are shown in Table 8.

Table 8. Research Grants

Grants	Citations	% of Total
National Natural Science Foundation	102	40.64
Ministries (except for the Ministry of Public Health)	79	31.47
State Administration of Traditional Chinese Medicine	25	9.96
Local Government	24	9.56
Ministry of Public Health	12	4.78
Other Grants	4	1.59
Grants from Other Counties	3	1.2
Military	2	0.8
Total	251	100

Discussion

The fast increasing traditional Chinese medical literature is a useful information source for medical professionals, as well as for the public. Since such information is published in many different journals, it can be difficult to locate traditional Chinese medical literature on a particular topic^[6]. However, TCMLARS makes it possible.

Cancer is one of the most dangerous diseases known to mankind. This bibliometric study based on TCMLARS shows that studies on neoplasms treated by Traditional Chinese Medicine are increasing. Most of the researches (69.72%) focus on clinical study. Lung neoplasm, stomach neoplasm, liver neoplasm, esophageal neoplasm, and breast neoplasm are the top five cancers covered in the traditional Chinese medical literature, which correlates to the mortality of neoplasms in the world^[7]. Among the traditional Chinese therapies for neoplasms, Chinese drug therapy predominates (71.09%), followed by integrated Chinese traditional and western medicine therapy (17.84%).

The study reveals that most authors of papers on neoplasms treated by TCM are clinical doctors, then medical educational workers and research professionals. In mainland China, authors of papers on neoplasms treated by TCM come from economically and culturally developed regions like Jiangsu (8.22%), Beijing (7.77%) and Shanghai (6.89%) rather than undeveloped areas such as Qinghai (0.26%), Ningxia (0.24%), and Hainan (0.09%). According to the search results, most research grants for studies on neoplasms treated by TCM are sponsored by the Chinese central government. National Natural Science Foundation is the most important grant.

Conclusion

The results of this study clearly outline the extent of clinical work and research on neoplasm treated by Traditional Chinese Medicine in China. TCMLARS is

proving to be the most efficient and effective means of literature retrieval and analysis for Traditional Chinese Medicine in the world.

References

1. State Administration of Traditional Chinese Medicine, P. R. China, "*General Information*", URL: <http://www.satcm.gov.cn>
2. Wu, Lancheng, et al., "*Chinese Traditional Medicine and Materia Medica Subject Headings*", Chinese Medical Ancient Books Publishing, Beijing, 1996
3. National Library of Medicine, "*Medical Subject Headings-Annotated alphabetic List*", National Library of Medicine, U. S. A., 1994
4. Charen, Thelma. "*MEDLARS Indexing Manual (Part I &)*", National Library of Medicine, U.S. A., 1983
5. Wu, Lancheng, et al., "*Indexing Manual of Traditional Chinese Medical Literature and other Medical Literature*", Institute of Information and Library, China Academy of Traditional Chinese Medicine, 1988
6. Jiang, Yongguang, "*Development and Information Requirement of Modern Chinese Medicine and Pharmacology*", Chinese Journal of Information on Traditional Chinese Medicine, 5:5 (May 1998):55-56
7. The World Health Organization, "*The World Health Report 1999*", URL: <http://www.who.org>

Weiyu Fan
Institute of Information on Traditional Chinese
Medicine
China Academy of Traditional Chinese Medicine
18 Beixincang, Dongzhimen Nei
Beijing, 100700
P R China
Phone 86-10-64048243
Fax 86010-64048243
Fanwy@mail.cintcm.ac.cn

INNOVATIONS IN NETWORKING TO PROVIDE ELECTRONIC DELIVERY OF DOCUMENTS TO HEALTH PROFESSIONALS IN THE WESTERN PACIFIC*

By Arlene Cohen, Claire Hamasu and Irene M Lovas

Abstract: Initiated by the University of Guam's Robert F. Kennedy Memorial Library (RFK Library), access to biomedical literature for health professionals located throughout Guam and the Western Pacific has changed drastically over the past five years. One of the reasons for the tremendous change has been the emerging capability to transfer documents electronically using the Internet.

This paper will discuss the growth of technologies, such as electronic scanners, telecommunications capabilities, and new methods of electronic document delivery using the Internet, such as ARIEL, to drastically reduce the time to deliver documents to the health professionals, while also reducing costs for this service.

It will also outline RFK Library's partnering with various United States government agencies, OCLC, institutions throughout the Western Pacific, and local health professionals in the area to achieve this goal.

The paper will provide statistics about interlibrary loan activity, documents scanned and turn-around time for delivery of articles to health professionals as well as expectations for future innovations.

Over the past decade, the University of Guam's Robert F. Kennedy Memorial Library (RFK Library) initiated expanded and timely access to biomedical information for health professionals on Guam and throughout the Western Pacific. To understand the significance of the accomplishment of transferring documents electronically, it is important to be aware of the geographic distances, the history and the political diversity of the area. Stretched across 4,500,000 square miles of the central and western Pacific Ocean, over 2,200 small volcanic and coral islands make up the region of Micronesia, which means "tiny islands".

Lying west of Hawaii, south of Japan, east of the Philippines and north of Australia and the equator, the total landmass of all these tropical islands is less than 1,200 square miles with a total population base estimated at approximately 300,000. The expanse of water approaches the size of the contiguous United States, but the total landmass is less than that of the state of Rhode Island. To make this area ever more complex, not only are the islands of Micronesia spread over a

* This paper was presented at the IFLA Conference in Jerusalem, August 2000

large geographic area, but each island group has its own unique culture, language and government structure. "The inhabited areas vary from idyllic villages with no cars or electricity to the high rise resort developments of Guam and Saipan."¹

During World War II, Japanese forces occupied most of the Micronesian islands. After the war, all the islands except for Guam were placed under the administration of the United States by the United Nations and called the Trust Territory of the Pacific Islands. During the ensuing years, each island group negotiated its political status with the United States. Today, Micronesia can be divided into five separate political entities. The United States Commonwealth of the Northern Mariana Islands (CNMI) includes the populated islands of Saipan, Tinian and Rota, and after World War II were placed under Trust Territory administration. The Federated States of Micronesia (FSM), consisting of the island states of Pohnpei, Chuuk, Kosrae, and Yap, are in the Caroline Islands group. They too were administered as part of the Trust Territory of the Pacific Islands from 1947 to 1986 and are now an independent country under a compact of free association with the United States. The Republic of the Marshall Islands is another independent island group in the central Pacific Ocean, which also were part of the Trust Territory of the Pacific Islands until 1979 when the Marshalls Constitution was ratified and the Republic of the Marshall Islands was created. The independent Republic of Palau is another group of volcanic islands and islets in the Western Caroline Islands under Japanese administration until the end of World War II. In 1996, the islands of Palau were the last of the Trust Territory islands to negotiate a relationship and signed a Compact of Free Association with the United States. On the other hand, Guam has remained an U.S. territory since 1898, except during the months of Japanese occupation in World War II. Now, within the region, it is considered to be the gateway to Micronesia and is the most economically developed of the Micronesian islands.

Given the varying governmental frameworks and the changing political leadership and status, obtaining consistent and reliable services funding for information, not only to health professionals, but for the population in general, has been a constant challenge. Under the administration of the Trust Territory of the Pacific, all the islands qualified for United States federally funded programs. Now, with their change in political status, several island nations have lost various United States federally funded programs, although they now qualify for aid programs from other countries such as Australia and Japan.

¹ Bendure, G. and Friary, N. (1995). *Micronesia*, 3rd edition. Lonely Planet Publications, Australia, p.9

Yvan Souares, in a recent article appearing in *Pacific Health Dialog*, a publication of the Pacific Basin Medical Association, summed up well the challenging reality. In his words: "These islands are scattered over 30 million square kilometers of the Pacific, an area almost four times that of Australia. Ninety-eight percent of that area is water, leaving a total land area only half that of the Northern Territory of Australia. For seven million Pacific people, the development of human networks in these conditions is both a challenge and a prerequisite to socio-economic development."²

The Beginnings

The driving force to this expanded access for health professionals had its beginnings in the early 1990's when the Pacific Islands Association of Libraries and Archives (PIALA) was established in 1991. The establishment of this multi-type library network grew out of the need to address the serious lack of information resources and human networks for resource sharing within the region, due in no small part to the lack of reliable funding and a commitment to library and archival development. From the beginning, this regional association was committed to fostering awareness, cooperation and resource sharing among libraries, archives, museums and related institutions of the Pacific islands.

With funding provided by the United States Office of Territorial and International Affairs, an organizational meeting was held at the University of Guam in February 1991 with participants from the Micronesian entities. At this meeting, the group named itself the Pacific Islands Association of Libraries and Archives (PIALA). Through the years, membership has expanded to encompass many other Pacific islands and countries worldwide. During the past ten years, conferences have been held annually to discuss the information needs of the area.

PIALA identified medical and allied health professionals within the region as one of the many groups of users with serious unmet needs. It found a partner to address these needs in the medical library network set up by the National Library of Medicine (NLM). One of the goals of the National Library of Medicine (NLM) is to provide access to and the delivery of information to health professionals, including those in rural areas and those serving minority populations. Another is to foster information access and resource sharing among not only health science libraries, but libraries of all types. These goals are carried out through its National Network of Libraries of Medicine (NN/LM) and within its eight regions, through

² Souares, Y. PPHSN and PACNET: the Pacific islands are now tuned into the 21st century. *Pacific Health Dialog* 1998;5(1):200

its Regional Medical Libraries (RMLs). The Pacific Southwest Regional Medical Library (PSRML), with headquarters at the Louise M. Darling Biomedical Library at the University of California, Los Angeles, is the Regional Medical Library for the region that includes Micronesia. To this end, PSRML staff have been active in PIALA, presenting workshops and joint sessions at five PIALA conferences covering basic healthcare resources, health reference resources³, consumer health resources⁴, resource sharing⁵, and most recently accessing Western medical information⁶

In 1996, the University of Guam Robert F. Kennedy (RFK) Memorial Library was designated as a NN/LM Resource Library, further supporting the delivery of information and local resource sharing to all areas of Micronesia. This designation was fitting, as the University of Guam is the major post-secondary educational institution in the Western Pacific with the mission that states “The University exists to service its learners and the communities of Guam, Micronesia, and the neighboring regions of the Pacific and Asia.”⁷

Electronic Document Delivery

Prior to 1998, all document delivery and Interlibrary Loan (ILL) activity throughout the Western Pacific was done either by using the postal system or FAX. Typically, documents would take from 2-3 weeks to arrive from the time the request was initiated. Moreover, the cost of Faxing materials was, and in many cases still is, prohibitively expensive. Additionally, the significant use of electronic mail and the Internet throughout the region did not begin until early in 1998. For

³ Crotts, J. Regional resource sharing and networking: A Union List of Serials for Pacific Islands. In: PIALA 95 Papers from the 5th Pacific Islands Association of Libraries and Archives Conference, edited by Arlene Cohen. Mangilao, Guam: Pacific Islands Association of Libraries and Archives 1996; 45-50.

⁴ Lovas, I. Here's to your health: consumer health information resources. In: PIALA 94 Selected Papers from the 4th Pacific Islands Association of Libraries and Archives Conference, edited by Arlene Cohen. Mangilao, Guam: Pacific Islands Association of Libraries and Archives 1995; 65-92.

⁵ Crotts, J. Regional resource sharing and networking: A Union List of Serials for Pacific Islands. In: PIALA 95 Papers from the 5th Pacific Islands Association of Libraries and Archives Conference, edited by Arlene Cohen. Mangilao, Guam: Pacific Islands Association of Libraries and Archives 1996; 45-50.

⁶ Hamasu C. Accessing Western medical information. In: PIALA 96 Proceedings of the 6th Annual PIALA Conference, edited by Arlene Cohen. Mangilao, Guam: Pacific Islands Association of Libraries and Archives 1997; 77-92.

⁷ University of Guam. 1999/2000 Undergraduate Catalog. Mangilao, Guam: University of Guam 1999. 12.

the RFK library, the spring and summer of 1998 saw the revolutionary improvement to its document delivery service.

The journey toward electronic document delivery began at the RFK Library in May 1998 with the help of Dr. Joe Iser, then the Director of the Office of Pacific Health and Human Services of the United States Public Health Service in San Francisco when their office permanently loaned a document scanner to the library. Although the scanner was provided to support the provision of medical and allied health information to the Pacific region, in essence it revolutionized the entire ILL operation in the RFK Library. Document scanning is one of the essential elements in electronic document delivery in that the scanned material can then be electronically sent to requesters attached to an e-mail message. With this scanner, the RFK Library ILL department now was able to scan materials held at both the RFK Library and the Pacific Collection of the Richard F. Taitano Micronesian Area Research Center (MARC) at the University of Guam and then electronically send them both throughout the region and worldwide.

At the same time that plans for the loan of the scanner were in process, the University of Guam College of Education's Communicative Disorders Program and the Government of Guam Department of Education entered into an agreement with San Francisco State University in California to provide a summer distance education graduate program for students residing on Guam. To support the program, a rapid and widely used Internet electronic document delivery system was required. This requirement presented the opportunity for acquiring ARIEL, an Internet based software package used by a significant number of libraries to electronically deliver documents; and to also establish a publicly accessible Internet (IP) address for the RFK Library Circulation Department to use with ARIEL. ARIEL was purchased and installed in May 1998, thereby putting another essential element in place for efficient electronic document delivery. Finally, the last essential elements, a laser printer and another computer faster than the old "286" model, were purchased.

During the summer of 1998, working with San Francisco State University Library's ILL department in the first use of ARIEL, the RFK Library delivered a total of 79 documents to students in the program. Of the total number requested, 41% (32 actual articles) were received at the RFK Library within 24 hours, with the majority of the remaining articles received within 2-3 days. This is particularly significant since there is an eighteen-hour time difference between the West Coast of the United States and Guam.

At the same time, the RFK Library also became a member of LIVS (Libraries Very Interested in Sharing),⁸ a group of libraries using the OCLC (Online Computer Library Center) ILL system who agree to share their resources at no cost to each other. The RFK Library had already been a full member of OCLC since 1992, using it for both cataloging and interlibrary loan.

In a paper currently in press submitted to the *Fiji Library Association Journal* in October 1999, Cohen wrote: "With our membership in LIVS and the use of ARIEL, both our ILL costs diminished significantly and periodical articles are delivered at a phenomenal speed."⁹

With the RFK Library using the emerging technology and fostering partnerships all over the world to share resources, the medical and allied health professionals and students in the Western Pacific were among those to reap the benefits. As a designated Resource Library of the Pacific Southwest Region, the RFK Library has the responsibility for facilitating document delivery throughout the region. However, even before this designation was established, in the early 1990's, the RFK Library began using *DOCLINE*, the National Library of Medicine document delivery system and tried to promote the use of *Loansome Doc*, the user interface for ordering medical and allied health documents locally and throughout the region. Prior to 1995, almost all *DOCLINE* activity emanated from University of Guam users. From January 1995 to December 1997, a total of 151 requests were processed through *Loansome Doc* and *DOCLINE*, with very few coming from outside the University of Guam. Although the viability of delivering documents as attachments to electronic mail was demonstrated between doctors on the island of Kosrae, Federated States of Micronesia, and the RFK Library, this mode of document delivery was now feasible with developments on the requester's end. First the significant use of electronic mail and Internet occurred throughout the region in 1998. Second was the availability of a free software program, DocView, from the National Library of Medicine. Now, with the scanner and ARIEL in place and requestors capable of receiving and viewing the documents, RFK Library began electronically delivering *Loansome Doc* and *DOCLINE* requests whenever possible as e-mail attachments. In the fall of 1998, working with the Pacific Basin Medical Association, procedures were developed for regional electronic document delivery for members of the association and a deposit account

⁸ More information about LIVS (Libraries Very Interested in Sharing) can be found on the WWW at http://www.library.sos.state.il.us/ils/oclc/lvis_des.html.

⁹ Cohen, Arlene. Innovations in resource sharing at the University of Guam's Robert F. Kennedy Memorial Library. *Fiji Library Association Journal*, 1999. Accepted for publication. In Press.

with the RFK Library was established. Subsequently, several other deposit accounts were established for medical and allied health users.

Providing documents for medical and allied health professionals using *Loansome Doc* and the *DOCLINE* system has soared. From June 1998 through March 2000, a total of 314 *Loansome Doc* and *DOCLINE* requests coming from patrons in Guam and several regional libraries including those on the islands of Pohnpei, Palau, Fiji and New Caledonia were received and filled. In the first year, from June 1998 through May 1999, there were 91 requests; however, as the word spread and area health professionals were trained, the numbers soared so that from June 1999 through March 2000, the ILL department received 223 requests.

Moreover, of those 314 *Loansome Doc* and *DOCLINE* requests received at the RFK Library since June 1998, 30 were filled from the collections of the RFK Library and MARC's Pacific Collection, using the scanner and sending them as e-mail attachments. Of the remaining 284 requests, 250 were received electronically through ARIEL and passed on as e-mail attachments.

Before using electronic document transmission, the usual time for documents to arrive was between a week to ten days, depending on the postal service. Today, requests are received within 2-3 days from the time they are entered into the *DOCLINE* system. During calendar year 1999, the average time to receive a document was 2.91 days. To appreciate the significance of this, one must consider that Guam is on the other side of the International Dateline and that *DOCLINE* is based at NLM, on the United States' East Coast. This means that when the RFK library opens on Monday morning, it is still Sunday in the Continental United States. An additional inconvenience, due to the time differences, is that because *DOCLINE* is not a 24-hour system, and the RFK Library staff can only use it during the morning hours of the workday, many of the requests might wait up to 24 hours or more before being sent.

Regional Resource Sharing Networks

With a viable, successful electronic document delivery service established at the RFK Library, serious efforts to expand resource-sharing networks throughout the Western Pacific are underway. In the past several years, resource-sharing relationships between librarians in the Micronesian region have been established, although communication between libraries was quite expensive and little activity occurred. However, now that electronic mail has become available to almost all the community college and public libraries in Micronesia as well as libraries on many other islands in the Pacific Basin, this is changing. Moreover, with the new

modalities for electronically sending documents as e-mail attachments through the Internet, our outreach capabilities are greatly expanded.

In October 1998, a proposal that the RFK Library redefines the region in terms of resource sharing was implemented on an experimental basis. In the proposal's redefinition, the area of the region was expanded to include all the islands falling under the Secretariat of the Pacific Community, formerly the South Pacific Commission. With this experiment in place, the ability to provide lower cost document delivery to libraries in Fiji and New Caledonia has been implemented through the University of Guam. Plans to continue the experiment and promote the service are underway.

In an attempt to reduce costs, some worldwide reciprocal relationships have recently been established. In August 1999, the RFK Library and the Chiang Mai University Medical Library in Thailand agreed to provide each other cost free document delivery, as a result of networking at the IFLA 1999 conference in Bangkok, Thailand. Most recently, the Savitt Medical Library in Nevada also agreed to provide reciprocal cost-free document delivery using DOCLINE, much the same as The LIVS relationships with OCLC libraries. From October 1999 through March 2000, RFK processed 7 cost free requests and hopes to develop more reciprocal relationships.

Although the outreach efforts of the RFK Library have successfully provided medical and allied health information to users in the region; sadly, only those islands with trained, professional librarians and/or motivated medical and allied health professionals have taken advantage of this new modality. More outreach and training must be done to reach those that still remain "out of reach!"

Conclusion

Although so much has happened in the last decade of the 1900's in the development and implementation of networking, both electronically and between people, and in resource sharing in Micronesia and throughout the Pacific, there is much more work to be done. The RFK Library's experiment with redefining the region to include those countries under the Secretariat of the Pacific Community can be viewed as the foundation for establishing a resource sharing network modeled after LIVS, the OCLC based group of libraries.

In the past, the greatest challenges to sharing resources were the great distances between islands, costly airmail delivery or very slow surface mail and a profound lack of cost-effective communications capabilities. Today, although telecommunications is still problematical on many islands, the biggest challenge is

education and training about resource sharing: what is it, what's out there, and how it can be done.

In a recent publication by Mary E. Jackson¹⁰ on measuring ILL performance, she wrote: "From listening to the libraries identified in this study as best performers, I have discerned four characteristics the successful have in common: They make intensive use of technology for every step in the process. They routinely question every step in their processes and regularly make improvements and adjustments (that is, they think about how they are working as the work). They value service more than control, and they are willing to risk occasional errors for faster and better service. Finally, their library directors are intensely interested in and enthusiastic supporters of their efforts." (1998, p. vii). It is no accident that all aspects of the ILL performance at RFK Library has surpassed expectations, since the staff has willingly experimented with change to provide a dynamic resource sharing service in a developing region.

By cultivating the human networks established within PIALA, and through working with the Secretariat of the Pacific Community (formerly the South Pacific Commission), the Pacific Basin Medical Association and other groups, it is hoped that these resource-sharing networks will continue to grow throughout the entire Pacific. Moreover, with the support of PIALA, local librarians can be encouraged to work with medical and allied health professionals in their efforts to advocate for and implement funding initiatives and training opportunities -- essential to in developing further access to information.

Arlene Cohen
University of Guam
RFK University
UOG station
Mangilao, GU 96923
671-734-9186
671-734-6882 (fax)
acohen@uog9.uog.edu

¹⁰ Jackson, Mary E. (1998). *Measuring the performance of interlibrary loan operations in North American research and college libraries: results of a study funded by The Andrew W. Mellon Foundation*. Washington, D.C.: Association of Research Libraries.

MAKING STONE SOUP: LIBRARY COOPERATION – A PROFESSIONAL RESPONSIBILITY OR NECESSITY?*

By Lois Ann Colaianni

My talk is about resource sharing and cooperation among medical librarians. I will start with a story to illustrate my theme. Second, I will briefly discuss the professional dilemma between serving one's own clientele and helping others. Third, I will mention some common ways of sharing resources that improve service to one's clientele and help others, illustrating how today's Internet/Web environment positively affects cooperation. I will close with a few observations from my own experience.

The story is the old folk tale "Stone Soup". The basic story is familiar to many people in Europe and America. Perhaps there is a similar folk tale in the Middle East. There are many variations in the story depending on the source of the tale, but the underlying principles of making stone soup are the same. In the version I will use today, the story starts with young woman preparing to leave home to go to the city to earn some money. Her mother and father are poor farmers and not able to grow and sell enough to support three people. Her mother packs bread and cheese and other food for her trip and the young woman sets off on foot. The city is farther away than she thought. Several days pass. She is tired and very hungry. She no longer has any food left and as she goes on her way, she stops and asks for food from villagers in each village she passes through. In each the villagers refuse to give her food, even a crust of bread. In fact, the villagers have hidden their food to prevent it from being stolen. It is clear that the villagers themselves have food, but not an abundance of it. However, they are unwilling to share even a small portion of what they have.

She becomes increasingly desperate. Without food she does not have the energy to walk. She realizes she will never get to the city to get a job to earn money and help her parents if she cannot obtain some food. Exhausted, she sits down under a tree by the path outside a small village. As she stares forlornly at the rocky path, she gets an idea. Since the villagers say they do not have enough food for

* This paper was presented at the 66th IFLA General Conference in Jerusalem, August 2000.

themselves, she will offer to make stone soup for the entire village. She tells the villagers that since they do not have enough food, she will make stone soup for the entire village. She asks the villagers for a large pot in which to make the soup, water, and a place to build the fire. They have never heard of stone soup. They are curious about how one can make soup out of stones but they agree and provide a large pot and water. They help her build the fire. She finds several stones that are just the right size and puts them in the pot of boiling water. A few villagers stand around watching the stones in the boiling water. After the stones cook for a while, she points out that good soup needs salt and one villager volunteers salt. More villagers come and watch. She explains that these kinds of stone make very tasty soup but some carrots add a nice flavor. Soon the villagers are bringing carrots and then potatoes and later cabbage and onions. She mentions that if there were some beef for the soup, it would be good enough for a "rich man's table". The villagers smell the wonderful aroma coming from the pot and are amazed that such good soup can come from these stones. Someone volunteers to contribute the beef and soon she declares that the soup is ready and fit for a "rich man".

She invites the villagers to share the soup. The villagers hurry to set up tables, get bowls and spoons. Some bring bread and cider. Soon everyone is sitting at the tables enjoying a wonderful meal with the stone soup as the main dish! There is much good will and after dinner the villagers sing and dance. The young woman is invited to stay the night. In the morning she is given breakfast and some food to carry as she resumes her journey. As the villagers gather to see her off, they thank her. One villager said "We will never go hungry, now that we know how to make soup from stones."

The theme of the story is that when enough persons share resources, no matter how small each contribution, the result will benefit all. No matter how poor in resources they are and no matter how much their institutions may be competing, the medical librarians in many parts of the world share their resources, benefiting all. In the United States resource sharing among medical librarians is a tradition which has lasted over one hundred years. Not only is it a necessity, it has become part of the medical librarian's professional responsibility. I know of no medical library that has all the materials needed to satisfy all its users' needs for patient care, research, education or administration. Certainly, the large libraries depend on others less often than libraries with fewer resources. The librarians in large libraries, however, usually feel a responsibility to share. Often they share with other large libraries, however many share with smaller libraries in their geographical region. They must find a way to do it so that their own users are not disadvantaged. One way to share and maintain service for their users is to provide copies of articles and not share physical volumes. This ensures that the titles

remain available to their users. The library staffs copy articles or chapters from a book and send these in response to requests. They often charge for the copies to pay for the paper, maintenance of the photocopier machine, and postage. These charges are determined ahead of time as the average cost to supply ten pages of copy. The requesting library knows the charges before requesting an item. In these ways the supplying library offsets expenses incurred when sharing resources.

I am working in a hospital library. The library receives 100 current journal titles and has about 600 books. Each day I request copies of about 2-4 articles from journals that are not in the library's collection but are available in other medical libraries in the area. Each day, I also make copies of about 2-4 articles from journals titles I do have, in response to requests from other small medical libraries within the area. This document delivery service is a very important, basic way of sharing resources. It benefits the users in all the institutions and their patients. I allocate time each day to share my institution's resources. Medical librarians in other institutions allocate time to sharing their resources with me and with others.

My sharing activities are repeated hundreds of times each day across the U.S. Every work day, MEDLIB-L, a listserv for medical librarians sponsored by the Medical Library Association, has about 40 requests for copies of articles, information about managing their libraries, reference information, or discussion items. Librarians who need to find a journal issue containing a copy of an article a user needs, information about how to search a topic on PubMed, or to answer a user's question, put their requests on MEDLIB-L. In almost all cases at least one other medical librarian answers the request that day! Some recent MEDLIB-L questions have been about selecting scanners, searching PubMed for "state of the art articles", locating a doctor in a particular institution in another country, benchmarking information, nursing policies, etc. In a way, MEDLIB-L enables the medical librarians to make "stone soup". Everyone shares resources, physical resources and knowledge, with those who need it. As a result, medical librarians throughout the country are better able to help their users. Their users and patients benefit and the librarians themselves benefit because they increase their knowledge.

Resource sharing does not just happen spontaneously. As in the story Stone Soup someone has to start it off. If the villagers wanted to make stone soup regularly, they would have to decide when and, perhaps, how each villager would contribute. It is the same with resource sharing. Several librarians must get together and decide what they can and will share. It is important to set up some guidelines. Some librarians may be able and willing to make photocopies of articles. Someone in one library may be cataloging large numbers of books and willing to share that

bibliographic data. If one library has a very large collection but not enough staff to copy the articles, it may be necessary to work out a way to fund or lend personnel to make copies for others. An easy and quick way to let others know that someone needs a copy of a specific article or information needs to be designed. It is also important to implement a way to notify all others that the request has been successfully filled, so others will not waste their time and energy also replying. Guidelines to ensure quality of service are needed. If you are making copies of articles, all need to agree to send the item within 2 or 3 days. If you are sharing cataloging data, the specific cataloging standards to be used need to be agreed upon. It is also helpful for small regional groups sharing resources to meet once a year or so to discuss how the resource sharing is going. What, if any, problems do the participants have? Are there changes in the arrangement to be made? For example, to use the stone soup example, you don't want everyone contributing onions and no one contributing any of the other ingredients.

The common ways for medical librarians to share resources are:

- Providing copies of articles from journals
- Answering reference questions
- Answering questions about managing the library and its services
- Providing bibliographic data for books, serials and audiovisuals

There are other ways. Some libraries in a large regional area participate in resource sharing by indexing local journal literature for a regional database for which one organization provides access. In this instance a librarian agrees to index one or more local journals, usually from his or her institution or country, and to provide the citations and indexing terms to the database provider. In this case, it is important for the librarians doing the indexing to use a common controlled thesaurus of indexing terms, to use a standard citation format, and to provide the data in a reliable and timely manner.

If space is a problem in a library, it is both impossible and impractical to retain large numbers of older volumes. Some librarians get together and decide what older, infrequently used journal titles they will each retain. Each librarian in the group agrees to retain and provide document delivery service on specific titles. Then librarians in the group can discard volumes for which someone else is responsible, knowing that one of their colleagues can and will provide a copy of an article from that title if it is needed.

The Internet has made resource sharing easier. A group of medical librarians can set up a Listserv like MEDLIB-L to send requests to each member of the group. Small groups do not need sophisticated systems like the National Library of

Medicine's DOCLINE. The group still needs to agree on what they will share and establish guidelines for the group, but they do not need complex software systems. Librarians can calculate the money, which can be saved through resource sharing on the Internet, and use that as one reason for funding an Internet connection in the library. There are, of course, many other reasons but this is one that can be quantified in terms of dollars. Economic reasons often are persuasive with administrators, but it is important to remember that resource sharing does cost money.

The Internet and Web have also provided new opportunities for establishing resource sharing arrangements. There are several areas currently very popular for resource sharing. Mary Riordan and Gerald Perry noted thirty examples of cooperative initiatives in their 1999 article in the *Bulletin of the Medical Library Association*¹. I will mention two. First, is sharing responsibility for the development of a list of high quality, important Web sites that contain health information. There are so many Web sites with health information that one librarian cannot be up-to-date. The commercial search engines are not comprehensive in identifying sites and they do not critically evaluate them. One librarian certainly cannot evaluate them all. Some groups of librarians have agreed to share the task of evaluating Web sites and sharing the evaluations. Each librarian or the librarians in an institution take responsibility for a particular subject area or several areas. The librarians agree on the criteria to be used in their evaluation, the subject headings to be used to describe the content of the Web site, and the format for distributing the information. Then, on a regular basis, the librarians read journals and search the Web for sites in their subject area. They apply the quality criteria. The National Library of Medicine's Web site for MEDLINEplus lists the criteria used in selecting sites. These can be used or adapted for your use. The sites that meet the criteria are written up according to the format and the resulting data posted as agreed. It is important for the librarians responsible for the subject area to revisit the sites regularly to make certain that the site is still at the posted address and that the content still meets the evaluation criteria. Someone may ask why if groups are already doing this, why not just use their results? In some cases, you may be able to; but in others, you will want to build your own list of quality Web sites because your criteria or focus differ from others. There might be particular religious or philosophical approaches, special diseases or geographical areas you would want to emphasize for your list.

¹ Riordan ML, Perry GL. Interlibrary cooperation: from ILL to IAIMS and beyond. *Bull Med Libr Assoc* 1999 Jul;87(3):251-3.

A second new area where cooperation is very useful is maintaining a list of journal titles or reference resources like the *Physicians Desk Reference* for which there is free Web access to full text. The titles and web addresses are constantly changing and the arrangements by which one can access the full text are frequently modified. In this area of cooperation, each librarian takes the titles in a subject area or a portion of the alphabet. They agree on the format of the final product, including the information to be given. For example, in addition to the journal title and the Web site address, it is helpful to know what years are available in full text and if there are any special access instructions. The final product is usually arranged alphabetically by the journal title. This is a project which one librarian can do, but after a time, most librarians find they cannot keep it up-to-date, so it is a task which is better shared among a group, even a small group.

A number of years ago when I was visiting medical school libraries in a country, I noticed that none of the libraries provided a document delivery system. Their serial holdings were published in book form and they all had the printed union list. But they never obtained a photocopy of an article from another library. When I talked with the faculty at the library school where most of the librarians had obtained their degree, I asked if they taught resource sharing through document delivery. The response was that of course they did. The discrepancy between what they taught in library school and the actual practice was explained as follows: "We teach theory and philosophy in school." Resource sharing must be practiced to be useful. The young woman in the story "Stone Soup" might have starved if the villagers had not contributed some food. I have been a medical librarian for thirty-four years. During that time I have visited hundreds of libraries which were involved in resource sharing. I have actively participated in resource sharing during my entire career. I have found resource sharing to be one of the most rewarding, and sometimes frustrating, aspects of my career in this profession. If you are not sharing resources now with other medical librarians in your region, I urge you to think about the story of the stone soup and think of one or two ways, you and a colleague can share resources to benefit you both and your users.

Lois Ann Colaianni
Presbyterian Intercommunity Hospital
12401 Washington Blvd.
Whittier CA 90206
USA
Erclac@earthlink.net

USING TECHNOLOGY FOR DISSEMINATING INFORMATION IN PAKISTANI MEDICAL COLLEGES*

By Azra Qureshi, M. Khurshid Alam, Syed Ahmed Naqvi

Abstract: In the developing world like Pakistan, academician, and researchers face problems in accessing the required information due to poor infrastructure or lack of library facilities for research in medical institutions. Health professionals are keen to know the latest information and state of the art technology on various topics advanced method of treatment or latest strategies for hospital management and related non-clinical health imperatives.

As communication technologies are beginning to have an impact on many information activities, INTERNET, INTRANET, List serve etc are providing access to an almost indescribable wealth of information. The Aga Khan University and such other private medical schools in Pakistan have the provision for these latest facilities besides traditional collections of books, sizable journal subscriptions to provide access. We are also out reaching those who may request/demand information in Public institutions and do not have these facilities available.

The Aga Khan University is developing linkages with national and regional institutions to enhance access and develop resource sharing through Inter-Library Loan agreements. These include besides document exchange, training and development of staff through journal club, library workshops, and in-house training programs for staff of all levels. This paper provides status of technology use in two private medical institutions of Pakistan and its impact on other health care institutions in the country.

Overview

Pakistan has 76 libraries of different sizes and capacities. Of these 30 libraries have Medline on CD-ROM and some electronic access and capability. About 100 journals are published in the field of health and biomedical sciences but only one journal, the Journal of the Pakistan Medical Association is indexed in Index Medicus: 30 journals are covered in Index Medicus for WHO Eastern Mediterranean Region. There are several indexing and abstracting tools that have been developed, e.g. Medical Literature in Pakistan (MEDLIP) but there is a need for a coherent bibliographical control of local literature. There also exists formal and informal interlibrary collaboration but on a national level this is also disorganized in the absence of a National Library of Medicine in Pakistan. The

* This paper was presented at the 8th International Congress of Medical Librarianship held in London, July, 2000.

Medical Library Association of Pakistan is at a premature stage of its formation. Problems encountered by most libraries are: lack of financial resources; lack of basic facilities; no provision for staff development and training, non-availability of trained people; and generally lack of vision and low priority for libraries.¹ In this scenario there are some foreign mission libraries such as British Council and American Center, which fulfill some biomedical information needs of health professionals, physicians, researchers and students.

This dearth of latest literature and falling standards of education and health care in public sector resulted into rapid expansion of universities and other institutions of educational excellence in private sector in the last two decades in Pakistan.

The Aga Khan University

AKU was established in Karachi in 1983 as the first private, autonomous academic institution to respond to the needs of developing countries and the Muslim World. The University fosters a scientific and scholarly approach to the study and solution of the problems of under-development and strives to develop relevant human resources to respond effectively. AKU is governed by a Board of Trustees consisting of a number of distinguished individuals, from Pakistan and overseas, with extensive academic and administrative experience.

Spread over 84 acres of land gifted by the Government of Pakistan, is the faculty of Health Sciences (FHS), the first faculty of AKU. While FHS comprises of a school of Nursing (1980) and a Medical College (1983), students gain clinical experience at the 654-bed teaching Hospital (1985) situated on the same campus. The FHS and Hospital together form The Aga Khan University Medical Center.

The charter granted by Govt. of Pakistan in 1983 additionally envisages AKU as an international University with campuses located in various regions of the world and addressing different fields of knowledge.

By 1993, the 10th year of its establishment, The Aga Khan University had added teachers' education to its academic programs through the establishment of the Institute for Educational Development (IED). Future academic endeavours of the University under consideration include: Institutes of Islamic Civilizations; Human Development; Economic Growth and Society; Planning and Management of Human Settlements and a College of Arts and Sciences.

¹ *Intercountry Meeting of Emlibnet Focal Points*. Egypt: Alexandria; WHOEMRO, 25-28 May, 1998 (Limited Distribution)

The FHS and the University Hospital serve as a focal point for The Aga Khan Health Services (AKHS), an international network comprising of over 200 health care units in South East Asia and East Africa. Such collaborations offer technical assistance, training and advanced referral facilities to five other AKHS hospitals while providing services to primary healthcare activities, which annually serve two million patients in these regions. The university also interacts with governments and international agencies in outreach. During this short period of time The Aga Khan University has earned recognition as a premier institution of higher learning in the country.²

Ziauddin Medical University

Dr. Ziauddin an Ex-Vice Chancellor of Aligarh Muslim University and ardent supporter of M.A. Jinnah founder of Pakistan became one of the leading educationist of undivided India. The University and its groups of hospitals have been established in his memory. An undergraduate program started from 1996, and from its inception the university decided to focus on Community Oriented Medical Education (COME), and Problem Based Learning (PBL) curriculum and to introduce innovative methods of medical education. The university has five campuses in the city.

The ZMU libraries start supporting users in their studies and research pursuits from the very first day of academic program. The emphasis is to assist users by providing computer-based information e.g. CD-ROM databases, Medline, etc. along with the books, periodicals and other ephemeral literature. The library staff and the computer experts train the students and assist teachers in learning the sources of information and how to access them. At present the libraries are serving the needs of 300 students, 125 teachers³ and research scholars. Around 26 Instructors and Senior Instructors are engaged in their research work for M.Phil or Ph.D. So far two physicians have completed M.Phil while one has received Ph.D degree from the University.

Finance

As the AKU medical college was planned in consultation with Harvard, McGill and Case Western Reserve Universities, the library also benefited from their experience and was given due importance. It was realized very early on that library means a long term financial commitment. Two Philanthropist families KURJI and

² The Aga Khan University (Brochure). RDPA, 1997

³ *Ziauddin Medical University*. M.B.B.S. Prospectus, 1999-2000

JIVRAJ of Canada to ensure library's future development and smooth provision of funds established endowment for library. The University spends an appropriate percentage of University budget on library facility of international standard. The library subscribes to 500 journal titles, which make AKU a national resource as no other institution has that provision. ZMU is a much younger institution striving to achieve accepted norms and standards. It spends about Rs. 1.2 million on journals, and Medline on CD-ROM, plus 0.5 million on books which is comparatively better than many other local institutions.

While the existing Jivraj and Kurji endowments are contributing towards the physical facilities of the libraries and acquisition of a steady stream of books and journals, the need is much greater. To encourage international participation, a "Book Campaign" was launched between 1993 and 1994 while celebrating 10th year of its establishment. For \$50 (the average cost of a textbook), a donor could participate in this exciting and important endeavor to strengthen and enrich library resources of The Aga Khan University.⁴

Similarly, the AKU's first batch of medical graduates (1988) celebrating their 10th year in North America (1998) set a precedence by donating \$100 worth of book each in whichever field they have specialized in to AKU library as a gesture of love for their almatemat. Several good things have followed in cash and kind since by our Alumni. AKU's resource development department plays a key role in monitoring these resources for the maximum benefit of institution and library is a great beneficiary of their effort.

Human Resource Development

HRD was identified as crucial area for the success of running the library. Realizing the shortage of trained manpower in the health sciences libraries and lack of training opportunities, as early as 1987, the library conducted the first national medical librarians workshop with the assistance of WHO (EMRO) and the British Council.⁵ collaboration has continued, and the library has implemented training programs for librarians from Afghanistan, Islamic Republic of Iran and Pakistan.

The library is playing a major role in this area by taking several initiatives. A full-fledged librarianship-training program is on university's future agenda. But currently a 12-module in-house continuing education program for library assistants' is offered every year. Besides a 2-week state of the art technology

⁴ Staying Ahead of Tomorrow: The Aga Khan University Book Campaign_ (Brochure). RDPA, 1994

⁵ Morgan Peter B. *A Workshop for Medical Librarians in Pakistan*. Health Libr. Rev. 1988 5; 7-10

exposure is provided to novice librarians or working librarians who request a hands-on experience in electronic information retrieval due to availability of facilities at AKU.

Forming a Journal Club by AKU librarians to share latest developments published in library literature has proved very useful in providing a forum to medical librarians of Karachi. This is leading to formation of Medical Library Association of Pakistan (MELAP) and a lot of other resource sharing projects together.

Similarly, to overcome the dearth of trained librarians, ZMU instituted a three month internship for fresh library graduates. The purpose is to provide hands-on training in the field of medical librarianship, before they take up formal employment. They learn NLM classification system, use of CD-ROM databases, Internet and Email which library schools in Pakistan do not provide adequately.

The trainees during this period are offered a monthly stipend and a certificate at the completion of training. So far twelve students in three batches have been trained. Almost all of them have been employed while 60% of them were selected to work in medical libraries.

Information Access

The acute shortage of scientific and technical literature in developing countries is a major handicap in the pursuit of higher education and research. The task of building strong academic centres, the postgraduate and research programs in particular, cannot be accomplished without strengthening library resources, and fulfilling growing needs and demands for information about new developments. The Aga Khan University library presently contains 24,000 books on various disciplines of health sciences, and subscribes annually to more than 500 international medical and nursing journals – the largest current collection of professional literature in Pakistan. In addition state of the art facilities for literature search on compact disks (CD-ROM) and INTERNET are also available.

The problems of collection building and acquisition in Pakistan have been narrated by Haider⁶ and Khurshid⁷ many times and are well known through library literature of sub-continent. It will serve no purpose to repeat those here. Suffice would be to say that AKU and ZMU exist within their environment and face those challenges. The pace of discovery of new knowledge is ever increasing and if

⁶ Haider SJ. *University Libraries in Pakistan*. Coll. & Res Libr 1975 Sept; 379-384

⁷ Khurshid Anis. Library Development in Pakistan in the Mid – 1980s Int. Libr.Rev. 1987 18:61-71

these universities are to continue serving as Paksitan's premier libraries, they need to renew and augment their resources on an ongoing basis.

In its 10th year of establishment the AKU's Board of Trustees received the Report of the Medical Center Committee (MCC) on direction for development of University over 10-25 years.

The Task Force for strategic planning on Library and Learning Resource Center (LRC) appointed in October 1993 suggested in its report that "a growing university with an increasing commitment to research and new graduate programs will require a growing library over the next ten years."⁸

Throughout the world, libraries are increasingly providing access to information that is stored electronically. Books and journals are and will remain important but academic libraries are meeting the information needs of their users by establishing electronic links with databases and with each other.

The Committee for library proposed that AKU library first be connected via Internet to other Centers worldwide. Then an internal network to allow AKU users to be connected to the world's information sources from their desk must link with the library and with each other. Both these have been achieved in the first phase of development in five years. Both INTERNET and INTRANET facilities are available on AKU Campus to at least most senior faculty and staff members, in the library and LRC for common use.

Resource Sharing/ILL

Libraries and librarians have always explored among themselves economic means of providing service, meeting information needs of their users. Resource sharing, cooperative acquisition schemes, inter-library loans have been the norms throughout the history of librarianship. In the information society "inter-library loan services are being replaced by the almost instant acquisition of articles on demand. Other materials (handbooks, textbooks in areas such as anatomy, and monographs) are being supplemented by electronic works that have been more fundamentally reconceptualized for the digital environment. Acquisition of published literature by libraries has transformed into the negotiation of site license for network access to material."⁹

⁸ The Task Force for Strategic Planning on Library and Audio Visual. (Unpublished Report). 1994

⁹ Lynch C. Medical Libraries, Bioinformatics, and Networked Information: a Coming Convergence. Bull Med Libr Assoc 1999 Oct; **87** (4): 408-414

The Journal Club of Karachi Medical Libraries has done a great service in this regard by pursuing the member libraries of the city to prepare the holding list of periodicals. The rising costs of periodicals combined with galloping inflation, devaluation of Pakistani Rupee and curtailment of library funds have made it practically impossible for the libraries to make more subscriptions. ZMU subscribes to 50 periodicals since 1996 and has been able to maintain it so far. College of Physicians and Surgeons Pakistan (CPSP) is subscribing around 59 journals. The Aga Khan University is subscribing more than 500 journals playing the pivotal role in supplying the documents to most of the medical institutions in Pakistan. It has also joined the Arabian Gulf Cooperative Council (AGCC) comprising of 24 academic medical libraries of the Gulf subscribing around 3000 titles together. This has cut costs in term of time and money around 70%. Now we approach British Library Lending Division (BLLD) only for 30% of our requests. If WHO's initiative to develop EMLIBNET (Emro Library Network) becomes a reality soon our problems of acquiring journal articles will be further eased of in terms of costs. Pakistan Scientific and Technical Information Center (PASTIC) is another source assisting all academic institutions and individual researchers in procuring literature not available in the country on subsidized rates.

Users Education

In Pakistan majority of students enter the university with limited exposure to library use – its potentials and functions. The academic librarians, therefore, have responsibility to assist in introducing the enormous sources of information and knowledge to develop in them a self-learning approach. This may be accomplished by formal means of instructions in the use of libraries. These instructions are transmitted in the form of orientation programmes including the introductory lectures on the purpose and functions of library, use of its resources, information retrieval from conventional and electronic resources.

The Aga Khan University from the very beginning ensured integrating library into its academic programs of all levels whether in nursing or medicine. Various levels of orientations and user education programs are conducted for nurses, medical students, interns and residents depending on their needs throughout the year and at the start of each academic program. These include from tours of physical facilities to one-day intensive case-based information retrieval workshops to residents and interns. Walk-in training calendar assigns few hours everyday to reference librarians for assistance to faculty or students in building capability of surfing Internet or searching CD-ROM databases. Librarians also participate in “Medical Writing” workshops in which they teach bibliography, citation verification and literature survey. The AKU librarians are also sought after by many other

institutions for advice and consultancy. The library is visited as a model library when new medical colleges are founded.

ZMU also puts great emphasis on library use and organizes two-week library orientation for the first year students of MBBS. This program consists of two-hour morning classes conducted by medical librarians of reputed institutions who inform the students on both conventional and modern aspects of librarianship and information sources. The afternoon session provides two hours with hands-on experience on the computers to enable them to learn techniques of computer operation and retrieving bibliographical and textual data from electronic sources. The students give high ratings to this program.

Library Automation

Development of the Integrated Library System (ILS) started in 1990 at AKU. The system was developed in FoxBASE under SCO UNIX. Dumb terminals and dot matrix printers were directly connected to the Unix machine. Data was entered related to books and journals holdings and the status of books on loan.

In 1993, to improve the system performance in terms of reliability and speed and to provide more flexible query features to the staff and customers, it was decided to port the ILS application to Informix SE under SCO UNIX. The new system was implemented in 1994. ILS was also integrated with the Student Admission and Record System (SARS) so that student information was automatically transferred from SARS to ILS thus eliminating manual data entry and associated data error problems.

In 1997, medical record charts of the hospital were also bar coded. Bar code readers are used to check-in and check-out charts. The objective of bar coding the medical record charts was to make sure that none of the charts were misplaced due to data entry errors and this procedure ensured the same.

Bar coding was introduced in the library in 1999. All books have been bar coded and bar code readers are used at the counter to check-in and check-out books thus ensuring 100% error free entry. At a later stage it is planned to modify ILS and provide bar code readers at the main exit of the library so as to further improve the security. Also all identity cards will be bar coded.

With the installation of campus wide network infrastructure, customers were demanding access to the Online Public Access Catalogue (OPAC) from their desktops. Early this year ILS database was moved to Informix Online under SCO Open Server and Web based OPAC has been developed using Active Server Pages (ASP) technology.

We plan to add many new features to ILS as library subscribes to more and more electronic journals and more and more publishers put their publication on the Internet.

Primarily the automation serves two purposes: a) automated housekeeping b) access to external databases and information retrieval. Computers are mainly used to assist a variety of functions such as maintaining and providing access to the catalog of item in the collection, managing the issuing and return of items from the collection, controlling the serial publications. These functions are lined in category one, while the category two will embody retrieval of information, searches through the CD-ROM databases, Medline and Internet.¹⁰

The main purpose for inducting the computers in housekeeping operations of library is to switch over to the cost effective, convenient, user friendly, speedy and time saving system. The librarians should be rational and judicious in adopting the automation of library services. It should not be for the sake of prestige only. The ZMU library decided to put the catalogue of books, reports, pamphlets, reprints and management of serials on computers, as the other housekeeping functions are presently not voluminous enough to be placed into automated form. For cataloging the software package LAMP 1.4 (Library Automation Management Program) developed by the Netherlands Library Development Project is used. This system has also assisted in managing the serials control and the preparation of holding list of the periodicals available in the centers.

There are many self-tutorial CD-ROM available with multi-media effect. People doing empirical research can download data and take it directly to other software platform for analysis and making graphical presentations. These databases are available to the readers for their research pursuits. The Center has also been compiling the website directory of important medical sites for the users.

ZMU has a strong commitment to excellent educational outcomes for the students in the areas of critical thinking, problem solving, and information skills. The Center strives to assist the users by providing access to an array of databases. "HMS Beagle", "Medscape", "eLibrary Trackers", "BMJ", "Lancet", "Nature" are some sites that are used extensively.

The promise of network technology via the Internet and localized Intranets present a new environment, and new tools, for partnerships and collaborations. With these technologies in hand, librarians continue to employ inventions in devising effective solutions to problems in providing accurate and appropriate information

¹⁰ Mathews DA & Picken FM. *Medical Libraries*. London: Bingley, 1979. P.89

at point of need¹¹. The faculty, students and research scholars are deriving the maximum benefit from the services provided to them through CD-ROM databases (MEDLINE, CINAHL, ERIC), and Internet Services. CD-ROM collection not only conserves space but also provide multi-user access in network environment. Libraries facing high incidence of mutilation of materials will benefit from such electronic products. Email services are helping the researchers profusely for contacting and collecting the scientific information from medical researchers living around the globe.

Automation started in Pakistani libraries in its late seventies. But the pace of adoption in the libraries is painfully slow. Only two libraries are fully automated so far. Others have partially accommodated technologies to substitute library operations. In majority of academic libraries IT has yet to take off due to multifarious problems.

Conclusion and Future

The Internet and especially World Wide Web, should be seen as a major driving force for change in the role of library/information professionals. The fact that the Internet has opened new ground for the end-user implies that a totally new approach is needed when educators decide goals and content for IS courses. “The trend that the location of information becomes less and less relevant, as we are able to move information around through “pull” and “push” button technology.”¹² The versatility of the multimedia and hypertext approach to information published via the Web, the end-user has found a way to become more information independent. Survival of librarians means survival of the knowledge base, approaches, values, practices and tools that must be applied to new problem areas.

Changes in the world at large since 1983, following on the break-up of USSR, has brought Muslim Countries onto the world stage that offer new potentials for AKU. The progressive globalization of the world and rising multi-culturalism present new opportunities and fresh challenges for the Aga Khan University “as an authentic representative of the developing and Muslim worlds”.¹³ AKU has firmly established itself as an autonomous institution of quality and integrity in Pakistan and abroad. It must offer education of high quality and bring forth-important

¹¹ Riordan ML, Perry GL. *Interlibrary Cooperation: from ILL to IAIMS and beyond*. Bull Med Libr Assoc 1999 Jul; **87**(3): 251-55

¹² Raitt D. ed. *Libraries for the New Millenium: Implications for Managers*. London: LA Publishing, 1997. p. 253

¹³ The Future of the Aga Khan University: Evolution of a Vision: Report of the Chancellor's Commission, 1994

intellectual products through its research and scholarship. That cannot be possible without high quality information centers/libraries and proactive, enlightened librarians, who will have to become extensively engaged with the processes and activities of their universities. The Chancellor's Commission Report stressed three broad characteristics for future AKU, of which –A University on the “information superhighways”¹⁴ of the world tops the list.

Bibliography

1. Comer DE. *The Internet Book*. 2d ed. Englewood Cliffs: Prentice Hall, 1994.
2. Gelfand MA. *University Libraries for Developing Countries*. Paris: UNESCO, 1971
3. <http://cwis.livjm.ac.uk/lea/aldham/triumph.htm>
4. http://www.geogianc.on.ca/depts.lrc/site_map.htm
5. <http://www.uclan.ac.uk/other/person/T&D/it/Courses/learnres.htm>
6. Kinder R. ed. *Librarians on the Internet: Impact on Reference Services*. New York; Haworth Press. 1994
7. Lancaster FW, Sandore B. *Technology and Management in Library and Information Services*. London: LA Publishing, 1997
8. Lancaster FW. *Second Thought on the Paperless Society*. LJ 1999 Sept 15; p 48-50
9. Morton LT, Wright DJ. *How to Use Medical Library*. 7th ed. London; Bingley, 1990

Azra Qureshi
The Aga Khan University
Stadium Road
Karachi, Pakistan
Azra.qureshi@aku.edu.on

¹⁴ Ibid

COLLABORATION AMONG SPANISH MEDICAL LIBRARIES*

By Ribes Cot, García Martín, Rodríguez del Castillo Martín

Introduction

Unlike other countries, in Spain the introduction of medical libraries throughout the whole country did not begin until the middle of the 20th century. Starting in the decade of the sixties, the National Health Institute carried out an ambitious programme in the creation of hospital centres. But these hospitals were conceived basically as medical care organisms. Only those hospitals of traditional or historical importance, such as the Hospital Clinic or Santa Creu i San Pau Hospital in Barcelona, San Carlos Hospital in Madrid or Marqués de Valdecilla Hospital in Santander had the benefit of medical libraries. In the seventies, a public health programme of hospital reorganisation was implemented, to provide for the training of full-time medical specialists. As a result of this, hospital libraries were set up in teaching hospitals as a support for both medical care and teaching activities.

In Spain there has been no tradition of special training for librarians (except in Catalonia, where the School for Librarians was set up in Barcelona in the first decade of the 20th century), nor is there a tradition of special libraries. Recognised university qualifications in Librarianship and Documentation were established in the eighties (3-years diploma) and in the nineties (5-years degree). Up until the present time, the existence or not of libraries in hospitals has always on the pressure of demand by doctors for the establishment of these services, and on the willingness of hospital management to implement them. The existing inequalities in the establishment of library services in centres of similar characteristics are due to the fact that they can be run by specially qualified professionals or by administrative staff. As a result there are obviously wide differences in staffing/funding and services, and for many years professionals have been pressing for the establishment of minimum standards for these libraries.

During the nineties, the Health Ministry developed a series of R+D (Research and Development) programmes in hospital centres (REUNI) which involved a

* This paper was presented at the 8th International Congress of Medical Librarianship held in London, July, 2000.

movement of ascription of libraries to these units. Over the last few years, libraries have been developing as a support framework for medical care, teaching or research as independent units, without being part of the organisational structure or the hospital as a whole. The demand for standards is the channel through which this situation can be regularised and hospital libraries can achieve their rightful place as an established hospital service for medical care, teaching and research.

Meanwhile, some medical libraries, especially those from hospitals, decided to collaborate in order to improve the situation. In 1986 the first Meeting on information biomedical documentation was organised in Santander at the Marqués de Valdecilla Hospital, with the following objectives: to exchange experiences, to update knowledge, and to create a platform for future co-ordination projects and co-operation.

Since 1986 there have been eight editions of the National Congress of Information and Documentation in Health Sciences. The second Meeting took place in Barcelona in 1987. The third Meeting was in Sevilla in 1990 . The fourth Meeting, this time in Bilbao, was in 1992 . The subsequent Meeting were held in 1994 in Palma de Mallorca , in 1995 in Madrid, in 1997 in Granada, and in 1999 the 8th Meeting took place in Santiago de Compostela. All these congresses have been recognised as of scientific interest by the Spanish Health Authorities and each Congress was organised around these of current interest. The Meeting are an interdisciplinary event attended by all professionals involved in the field of information and documentation in health sciences (hospitals, medical schools, pharmacy faculties, research centres, etc).

This means that although there has been no institutional support al national level, libraries have been aware or the need to bring their profession up to date, as well as to create an environment in which to frame all professional aspects for their own initiatives.

To this end we have taken advantage of the political configuration of this country, which has provided professional librarians with a platform for the communication of experiences and the planning of services.

These meetings have helped to set up a human network of co-operation, which has given rise to the following landmarks:

1. Firstly, the elaboration of the C 17 Catalogue of publications and periodicals named after the 17 autonomous communities, which make up the Spanish State. Contributions were made by all the hospital and university libraries and related institutions, providing data and updating. This catalogue has been used to initiate interlibrary lean services and to supply users with the available information, and

also informs librarians of the resources of other centres. Nevertheless, although at the level of university libraries there is a network, REBIUN, and a standardised system of loans and charges, it has still not been possible to regularise and standardise this service among hospital libraries.

2. Secondly, the elaboration of a study of the situation of health sciences libraries: the current situation and future prospects. Published in 1998, brings together relevant data on the situation of these libraries and proposes a national system of bibliographic and documentary information in health sciences, called SINAPSIS, which has not received any support at institutional level.

What then is the current situation in Spain at the dawn of the twenty-first century? Spain is different in this too. It is the Spanish sunshine. With the incorporation of information and communication technology, the development of Internet and its integration into so-called traditional library procedures, various co-operative projects have emerged in Spain. All of them through autonomous communities and with institutional backing, which, notwithstanding all the above-mentioned precedents, and based on the development of digital or virtual libraries, aim to resolve this situation. At the present time, in several regions of Spain, health sciences libraries are working to develop different models and systems to share resources. Of these, we shall only give a brief mention. But we do wish to emphasise the important reduction in the annual budgets assigned to libraries for materials acquisition which has taken place over the last 10 years, and which has had a decisive influence on the need to share increasingly scant resources, as public spending in the area of R+D (research and development) has been reduced considerably.

In addition, another curious characteristic of these institutional projects, which we are referring to, is the fact that although they are based on the participation and the work of professional librarians, they are directed by doctors or by other technical professionals. Another characteristic is that none of these projects contemplates the co-ordination or internal co-operation between similar specialist libraries in other communities, or even with other libraries, such as those in universities.

Projects

We describe those projects, which seem to us the most interesting: The regions where these projects are being carried out are: Galicia, the Basque Country, Madrid and Catalonia and Andalucía. The Galicia Health Service (Servicio Galego de Saude- Sergas) has brought together 17 of the most important hospitals libraries in order to unify the following parameters:

Data base distribution

ISBD bibliographic description

Translation of medical subjects headings to index registers Elaboration of guidelines

And purchase and setting-up of the Data Treck programme for the following tasks: cataloguing, lending, acquisitions, control of periodicals, and online catalogue. This idea first germinated in 1994, and has been functioning since January 1998.

In Catalonia, there are several projects under way, since this is a region of Spain where libraries have always been the most developed, and of these projects I am going to refer specifically to two which we consider the most interesting: The first is that of the Josep Laporte Library Foundation and the second is called Galenics. The Josep Laporte Foundation is a Consortium of the medical libraries with the following mission : To provide and offer information and knowledge, with the aim of facilitating in health professionals and users quality decision-making; To direct and fulfil present and future needs in information and knowledge of health professionals, teaching staff; students and users, by means of specific documentation strategies incorporating novel communication and information technologies, To promote the creation, retrieval, selection, classification, synthesis, integration, transfer and dissemination of knowledge in health and life science. It consists of:

A traditional Medical Library: the union of three existing medical libraries.

Teledocumentation centre.

A Digital Library: with a basic package including five bibliographic data bases, sixty journals with full text, and products based on evidence synthesis.

Secondly, and also in Catalonia, we have the Galenics project. This is a system for the retrieval and diffusion of information in the area of health, aimed at professionals. Galenics thus, becomes a useful system of communication and an important reference point for all those involved in this area.

The Galenics structure is as follows:

Institutionally Galenics is a foundation

Administratively Galenics is cofinanced synergically managed with a philosophy of consortium

Functionally is a Metaserver

Neutral node

Instrument for formation and training

Managed by Fundacio privada Galenics, through an agreement, any institution in the health area, can become members such as:

- Professional associations
- Hospitals
- Faculties
- University
- Publics and private health institutions

In the Madrid area we have the following project:

A Survey for Hospital Libraries in Madrid, was carried out in April 1999. The results of this survey provide up-to-date data on libraries and their resources, economic, human, and material.

The Knowledge of these resources has helped to evaluate and accept and an agreement for co-operation, set up within a legal framework, for hospital libraries in the Community of Madrid. This agreement will bring together these libraries as a consortium, which will enable them to continue working collectively, with statutes, which define and identify them, as well as regulating their collaboration.

In the Basque Country there is a co-operative project for the management of biomedical knowledge. In 1998 the General Direction of Osakidetza, (this is the name of Health System in the Basque Country) approved a project in order to increase the efficiency of information access and the potential to share experiences. The plan:design of electronic supply trough a co-operative network coordinated configuration of collections, integrated purchase of journals, books and databases, unified catalogue for own collection, electronic access catalogue.

In Andalucía, in 1999 the regional health Service (Consejería de Salud) started a project of consortium between health science libraries. The first step will be to carry out an exhaustive survey in order to know the real situation of the all health science libraries at the Community. The project includes the creation of a large Intranet who will allow common access to different data bases, electronic publications, and online catalogues.

The National Library of Health Sciences was created in Spain in 1996. The main projects of this institution at that moment are:

1. To guarantee, co-ordinate and maintain up to date the Spanish Collective Catalogue of Health Sciences Libraries C17.

2. Maintenance the WEB page of the Library with the following directories: Spanish medical publications, Health Sciences Libraries, Scientific Societies, Congress and workshops
3. To make a database that will cover all the Spanish bibliographic publications in Health Sciences that will become the IBECS (Spanish Bibliographic Index of Health Science)
4. Start with continuing education program for librarians
5. They have also a project of co-operation with the Iberoamerican Network BIREME

Discussion

If the situation until now has been disorganised and uncoordinated, it is our hope that these projects will contribute towards making use of the experience gained by the professionals involved, and will not further atomise and fragment an already disorganised and uncoordinated situation.

So, Spanish health sciences librarians are conscious of the need to provide a platform for professionals to come together and discuss the problems of information provision, access and management and develop new resources.

It is also necessary to improve the skills of librarians so that they can play an important role together with practitioners to adopt evidence-based approaches to health care and decision making.

The skills required to retrieve relevant and exhaustive information in clinical settings give librarians an excellent opportunity because they must play a major part in helping clinicians, researchers and health professionals in general to retrieve information under the best conditions.

Spanish health sciences librarians, also realise the importance of national information policies and governmental recognition to provide an effective network with legal and administrative bases for integrating a real national system of information in health sciences. In addition to this, the importance of continuing education for health sciences librarians to develop new systems and services for information retrieval, as well as the need for qualified librarians who are able to provide relevant information on health decision making.

References:

1. Olagüe, G, De Manuel A, Pasadas C. El nuevo marco Jurídico (Nacional y Autonómico) de las bibliotecas de Ciencias de la Salud. En: Terceras Jornadas de Documentación e Información en Ciencias de la Salud. Sevilla 14,15 y 16 de marzo de 1990: 11-22
2. MIR Cierra. MIR Medicina del postgraduado 1982, 4 dic. (editorial)
3. Junta de Andalucía. Normas de Acreditación de Hospitales, Madrid, Alhambra, 1985.
4. Carrasco AL. González E. Manual Práctico de Acreditación de Hospitales. Valladolid: Editora Médica Europea, 1993
5. Generalitat de Catalunya. Direcció General d'Assistència Sanitària. Acreditació de centres assistencials: informe d'un comitè d'experts. Barcelona: Departament de Sanitat i Seguritat Social. Secretaria General Tècnica, 1982
6. Primeras Jornadas de Información y documentación Biomédica. Hospital Nacional Marqués de Valdecilla. Instituto Nacional de la Salud. Santander, 1987
7. Coordinadora de Documentación Biomédica. Segundas Jornadas de Información y Documentación Biomédica. Barcelona, 8, 9 y 10 de octubre de 1987. Hospitalet de Llobregat, 1989.
8. Terceras Jornadas de Documentación e Información en Ciencias de la Salud. Sevilla 14,15 y 16 de marzo de 1990: 11-22
9. Asociación Vasca de Archiveros, Bibliotecarios y Documentalistas. Cuartas Jornadas de Información y Documentación en Ciencias de la Salud. Bilbao, 16, 17 y 18 de junio de 1992. Bilbao, 1993.
10. Associació des Bibliotecaris, Arxivers i Documentalistes de les Illes Balears. Libro de Resúmenes de las Quintas Jornadas de Información y Documentación en Ciencias de la Salud. Palma de Mallorca, 4, 5 y 6 de mayo de 1994. Palma de Mallorca, 1994.
11. Sextas Jornadas de Información y Documentación en Ciencias de la Salud. Universidad Complutense, Madrid, 1995.
12. ASABIME. VII Jornadas de Información y Documentación en Ciencias de la Salud. Granada, 6,7 y 8 de noviembre de 1999. Granada: ASABIME, 1998

13. García Martín MA, Ribes Cot MF, Rodríguez del Castillo Martín M. Estandares para Bibliotecas Hospitalarias. Ponencia presentada en VIII Jornadas de Información y Documentación en Ciencias de la Salud. Santiago de Compostela, 1999.

Ribes Cot
Biblioteca. Hospital Universitario Marqués de
Valdecilla
Avda. Valdecilla s/n.
Santander
Spain
E-mail: bibrcm@humv.es

García Martín
Biblioteca. Hospital de Cruces
Plaza de Cruces s/n.
Bilbao
Spain
E-mail: magarcia@hcru.osakidetza.net

Rodríguez del Castillo Martín
Biblioteca. Hospital Virgen de las Nieves
Avda. Fuerzas Armadas s/n.
Granada
Spain
E-mail: mercedes@hvn.sas.cica.es

SEARCHING FOR THE 3Rs: FACILITATING COMPLIANCE IN THE BIBLIOGRAPHIC SEARCH FOR ALTERNATIVES*

By Mary W. Wood and Lynette A. Hart

Abstract: The search for alternatives is a requirement in several countries, but rarely are the logistics or the scientists' concerns considered. At the University of California Center for Animal Alternatives (UCCAA) we offer workshops on the nine UC campuses, teaching researchers, IACUCs, and librarians how to approach the alternatives search, including search strategy, appropriate terminology, and database suggestions/links. We are also developing a web-based resource along these same lines. Scientists generally approach an alternatives search as they approach any search; they search Medline, using the terms with which they are most conversant, and consider that this is adequate. However, there are several free bibliographic databases which are both appropriate and readily accessible, including Medline, Agricola and Toxline. A growing number of alternatives databases are available; these are rarely accessed by the scientific community. Websites such as AltWeb, Invitox and AWIC provide a virtually untapped wealth of information. There are also free government research sites which provide information on current research, such as CRIS, CRISP, and CORDIS. The terms used are equally as important as the database selection. Searching with the single keyword "alternatives" is less than adequate. Synonyms in all three areas of alternatives- replacement, reduction and refinement- must be developed and employed, such as anesthesia and analgesia, enrichment and husbandry, stress and distress. By offering concrete advice and assistance, as is included in our workshop curricula and on our website, the scientists can more easily perform worthwhile alternatives searches. By making use of the new technologies to create web-based search templates specific to the scientists' needs, we can help make the searching easier while also more relevant.

Introduction

The UC Center for Animal Alternatives was created by the University of California Office of the President due to a mandate by the California Legislature. Our purpose is to be a systemwide resource for all nine campuses in the University of California system, a single location collecting, housing, and disseminating information on alternatives to the use of animals in research. We are physically located at UC Davis in the School of Veterinary Medicine.

This paper focuses on the bibliographic search for alternatives to the use of animals in research, teaching, and testing. As medical and veterinary librarians,

* This paper was presented at the 8th International Congress of Medical Librarianship held in London, July, 2000.

you understand the intricacies of literature searching. However, perhaps you are less familiar with the area of animal alternatives, and unaware that research scientists at our facilities have information needs that are not adequately being met. Though a medical and veterinary librarian at UC Davis for many years, I did not learn of this alternatives literature search requirement until I came to the Center three years ago. In order to understand the search and the requirements, I will provide you with a short overview of the issue; it will also provide the context for this regulation which affects us all so directly.

Alternatives Legislation

The Principles of Humane Experimental Technique is a book which was first published in 1959. It was written by two British researchers, William Russell and Rex Burch, who were the first to advocate the 3Rs in animal research: Replacement, Reduction, and Refinement. The book and the subject were fairly well ignored for about 25 years, after which time it was rediscovered and has since become the basis and the common language used in the discussion of alternatives.

The 3Rs that these British scientists brought into the vernacular stand for replacement, reduction, and refinement. Replacement is the replacement of animals with non-animal models or techniques. Reduction is reducing the number of animals used. Reduction can be achieved by quality literature searches, appropriate statistical design, use of pilot studies to estimate variance, use of transgenics, and changes in toxicological testing. Refinement is a technique or procedure to reduce pain and distress. Refinement offers the best opportunity for immediate implementation, and is the least often considered. Proper use of analgesics and anesthetics, knowledge of the test species' physiology and behaviors, modifications in restraint, handling, and blood collection techniques, and proper training of personnel all constitute refinements.

In the United State, it is the Animal Welfare Act, enacted in 1966, which legislates animal welfare. It started out as very basic legislation, but has continued to be amended, each time becoming more definitive, more specific and more restrictive. The 1985 amendment was called the "Improved Standards for Laboratory Animals Act"; it stated that pain and distress must be minimized in experimental procedures, and that alternatives to such procedures must be considered by the Principal Investigator. The 1989 amendment expanded on this by stating that the PI must consider not just alternatives, but all three Rs. This last amendment is 11 years old, yet this requirement to consider alternatives before any animal research can proceed is still controversial.

For members of the European Union, the European Directive states that the use of alternatives, where possible, is a legal requirement. This same requirement is also incorporated into the Convention for the Protection of Vertebrate Animals Used for Experimental and other Scientific Purposes by the Council of Europe.

"An experiment shall not be performed if another scientifically satisfactory method of obtaining the result is sought, not entailing the use of an animal, is reasonably and practicably available."

Together with the Codes of Practice on the Housing and Care of Laboratory Animals, the Animals (Scientific Procedures) Act clearly defines appropriate use and appropriate consideration of alternatives to the use of animals in the UK.

"The Secretary of State shall not grant a project licence unless he is satisfied (a) that the purpose of the programme to be specified in the licence cannot be achieved satisfactorily by any other reasonably practical method not entailing the use of protected animals; and (b) that the regulated procedures to be used are those which use the minimum number of animals, involve animals of the lowest degree of neurophysiological sensitivity, cause the least pain, suffering, distress or lasting harm, and are most likely to produce satisfactory results."

The UK and USA are not the only countries legislating animal welfare. Legislation is worldwide, and even though they may be members of the European Union and follow the European Directive, member states such as France, Germany, Italy, Netherlands, Norway, Sweden, and Switzerland have additional, supplemental legislation, requiring even further consideration of animal welfare and alternatives in animal research. Countries not in the European Union, such as Australia, New Zealand, and Japan also have legislation covering the care and use of experimental animals.

In response to the UK requirement, librarian Krys Bottrill at FRAME, which is the Fund for the Replacement of Animals in Medical Experiments, created A Guide to Searching for Alternatives to the Use of Laboratory Animals (<http://www.frame-UK.demon.co.uk/guide/index.htm>). It is designed for the researcher, intended to assist them in performing quality searches for alternatives. Dr. Bottrill's guide is an extremely thorough and useful resource, one which explains and instructs, as well as guides the user. In addition to the guide, she has also offered workshops for UK scientists on this topic.

Search Strategy

We have established that most countries require the use of alternatives to painful and stressful procedures when alternatives are available. In order to determine if such alternatives exist, researchers are expected, and often times required, to search the literature. This is where we medical and veterinary librarians enter the picture. While leaders in their respective areas, scientists are not expert in bibliographic searching, nor should they be expected to be. We are the information professionals. We can help them find the information or teach them the best strategy to find the information themselves. There is an approach to searching for alternatives which will provide the best hope of locating relevant information, but it is important to remember that you will not always find alternative methods which can be implemented in the research. The most basic thing to remember is that the alternatives for which we are required to search include all 3Rs, meaning replacement, reduction, and refinement, and not just replacement. The next two essentials may be intuitive to you, but are less so to our faculty. A thorough list of synonyms must be developed and the appropriate databases must be searched.

When working on library research, identify the search terms specific to your field of study, search as usual, peruse and identify anything relevant to 3Rs - in vitro, less evolved species, anesthesia and analgesia, statistical methods, etc. Then perform a second search to further investigate the 3Rs, by adding alternatives concepts and synonyms. You must use the appropriate terms which will be most helpful in searching for each R. Beginning a search with a list of possibly useful terms specific to alternatives can be extremely helpful. (Table 1) Subject headings such as Animal Welfare and Animal Testing Alternatives exist but are less than useful because most articles are not indexed as such. Searching by these subject headings tends to retrieve articles with a broad discussion of the issue as opposed to useful suggestions on alternative methods. Keyword and synonym searching is the most productive approach. Is there an analgesia available which won't interfere with the experimental results, is there a caging arrangement which will make the animal more comfortable, is there an enrichment device which will make the animal less fearful or less bored? The 3Rs are very open ended and any improvement at any level would be considered an "alternative".

Alternatives search terminology

alternativ*	husbandry
analges* or sedativ*	interactive
anesthe* or anaesthe*	method*
animal* test* alternat*	model*
anxiolytic*	postop* or postsurg*
artificial*	replace*
assay* or technique*	restrain*
behavi* enrich*	sedat*
computer* imag*	simulat*
culture	teach*
environ* enrich*	train* or educat*
euthanasia	video
handling	virtual
housing	vitro
	welfare or pain or stress or distress

Table 1

In addition to search terms, it is imperative to search in the appropriate database. While Medline is an excellent database and should be searched, it does not index all of the world's literature. Multiple database searches are required if the search is to be done in good faith. (Table 2) Agricola and Toxnet are two free databases you are probably familiar with. Agricola is particularly good because it indexes some of the more obscure publications, including the journals Animal Welfare and Alternatives to Laboratory Animals. Toxnet is an essential database for any toxicological research or protocol. CORDIS, CRIS, and CRISP all provide information on research funded by governmental grants. NORINA is the Norwegian Inventory of Alternatives which is a unique and comprehensive database of alternatives used in education.

Free Databases

AGRICOLA	CORDIS	Medline
CRIS		NORINA
CRISP		TBASE
		TOXNET

Table 2

There are additional databases that should be searched, dependent on the subject and protocol. (Table 3) Some of these databases you will have available to you free of charge, others available only for a price. You may also have other useful resources at your institution that I do not have listed here. In any event, legislation is not usually concerned with the expense of locating information; if the

investigator is working with sturgeon, Aquatic Sciences and Fisheries Abstracts should be searched. Proposals using exotic animals or reptiles should always be searched in Zoological Record for information on husbandry and behavior. PsycInfo provides a wealth of information on refinement, especially enrichment. Computer Articles and INSPEC should be searched whenever there is a possibility of computer modeling. Each database may have a use depending on the research and/or the animal.

Additional Bibliographic Databases

ABI	Fish & Fisheries
ASFA	INSPEC
BIOSIS	Lexis-Nexis
CAB	PsycINFO
CC	Sociological Abs.
Computer Art.	Web of Science (ISI)
Dissertation Abs.	Zoological Abs.
ERIC	

Table 3

There are animal welfare and alternatives organizations, as well as government-sponsored animal care groups, that provide extremely useful information and access to resources via their websites. (Table 4) AltWeb is a website located at the Center for Alternatives to Animal Testing at Johns Hopkins University in the US; they have taken the lead in organizing a centralized database for alternatives information. Governmental animal welfare organizations include ANZCCART for Australia and New Zealand, AWIC in the US, and CCAC in Canada. ECVAM, ICCVAM, and Invitox are databanks of invitro techniques in toxicology collected in Europe and the US. The list of helpful sites is long, most of which are linked from the UCCAA website (http://www.vetmed.ucdavis.edu/Animal_Alternatives/main.htm).

Other Resources

AltWeb	ICCVAM
ANZCCART	INVITTOX
AWIC	ILAR
CCAC	NCA
FRAME	UCCAA

Table 4

Embedded Search Templates

Another way we have found to assist the researcher is through the use of embedded search templates. An embedded search gives one the ability to store a search strategy as a link, to later click on the highlighted term, and rerun the search in real time. This means that anytime the link is clicked, the most recent citations in that database will be retrieved. This technology is ideal for repetitive searches, but what is unique is that more than one person could make use the same search. Anytime a researcher is using mice, alternatives to painful or stressful procedures, analgesia, anesthesia, and euthanasia must be searched. To have a site which maintains commonly needed searches so that any scientist could click and get the most recent information, without knowing which database to search, without knowing the best search strategy, would be very useful. To create a template is a simple process of selecting a database, developing an effective search strategy, saving the search URL, and pasting that into a webpage as a link.

Since Agricola is a free database and indexes publications very relevant to the area of animal care, it is ideal for accessing via an embedded search. From the UCCAA webpage on Refinement of Research Methods with Mice, listed under Agricola are several embedded searches: blood sampling, enrichment, euthanasia, refinement, and welfare. The search strategy/html format is hidden behind the link. When the "Enrichment" link is clicked, the computer automatically goes to Agricola and performs a current search using the strategy that has been embedded. After a moment, the Agricola search results page appears, from where one can click and go to abstracts, full citations, etc.

PubMed (Medline) is another free database providing access to valuable alternatives information, and they even provide instructions on how to store a search strategy as a link. The directions show how to save the search strategy, once you have identified the best approach, whether it is to use MeSH terms, text terms, limits, or whatever. You then copy the appropriate URL and paste it into your website as a live link. Whenever clicked, a live search is begun and the most recent PubMed information retrieved. Again, from the webpage on Refinement of Research Methods with Mice, listed under PubMed (Medline) are examples of commonly needed searches: blood sampling, caging, enrichment, euthanasia, handling, refinement, stress, transgenics, and welfare. By clicking on "Enrichment", a live search in Medline is initiated, using the search strategy embedded in the link. These search results are just like with a regular Medline search where one can go to the abstracts, related articles, etc.

Partnerships and Local Support

Creating search templates makes aspects of the alternatives search much easier for the scientist as well as making it better by using good search strategy and searching in the correct databases. It not only assists the researchers with regulatory compliance, but also educates them on information retrieval. It shows, too, how helpful and knowledgeable librarians are, especially librarians at their particular institution. By partnering with their local, in-house librarian, the scientist not only gets the assistance of an information professional, but also a colleague familiar with their facility's unique strengths and resources. For example, UC Santa Cruz librarians, located on the coast, are going to know a lot more about the resources relevant to marine scientists than I am at Davis, an inland veterinary school. And I am going to be much more familiar with bovine mastitis than my colleagues located at the biomedical library in the very urban UCLA.

The bottom line is that alternatives searches are required for regulatory compliance, and there is a need for our expertise and an opportunity to expand our services for our primary clientele. Research scientists at our institutions need our assistance and expertise with these alternative literature searches, yet they remain silent. We need to reach out to this audience, let our institutional officials and animal oversight committees know that we are aware of the search requirements and are available for instruction and referrals. We can also offer our assistance directly to the researchers. Even though they think they already know everything, and have a difficult time admitting that they don't know much about searching and/or multiple databases, if we publicize our availability to help with these searches, offer workshops, create an informational website, or develop search templates specific to their needs, they will realize that we are there to assist them with all aspects of their research goals.

Mary Wood
UC Center for Animal Alternatives
School of Veterinary Medicine
Davis, CA 95616
USA
530-752-9016
530-752-8608 fax
mwood@ucdavis.edu

CREATING A STATE-WIDE VIRTUAL HEALTH LIBRARY: THE MICHIGAN EXPERIENCE*

By Harvey Brenneise

Abstract: The AccessMichigan Electronic Community Health Information Initiative (AMECHII) [<http://www.mphi.org/AMECHII/>] is a response to a recommendation of the Michigan Information Technology Commission Report, “we recommend improved access to high-quality health care information for all Michigan stakeholders.” The desired outcome is ubiquitous and universal access to high-quality, timely, reliable and valid health information for health consumers and practitioners regardless of geographic location in the state, many of whom are currently unserved or under served. This project is truly multi-type—including public, general academic, academic health science, hospital, and special libraries. The objectives include extending the current network infrastructure to serve all libraries and to negotiate state-wide licenses for core and extended electronic collections, including reference materials and serials, recognizing the economic realities in American hospitals and libraries and the need for economic viability of publishers. This pilot project, if successful, will be used as a model for other state-wide information projects. The planning process, which will begin with a comprehensive needs assessment, gap analysis and economic model, will result in the design of a state-wide health information architecture/system design, and will include economic sustainability and new paradigms for library collaboration and federation in the acquisition and distribution of electronic resources over a wide area. AMECHII will also seek international partnerships with developing countries to cooperatively develop an electronic health information infrastructure in those nations, and to seek external funding to do so.

Biography: Harvey Brenneise, MSLS, MA, is library director at the Michigan Public Health Institute in Okemos, Michigan, where he is developing the Michigan Community Health Electronic Library for the Michigan Department of Community Health. Prior to that he was systems librarian at **Andrews University**.

The seeds for AMECHII were planted with the release of the Michigan Information Technology Commission (MITC) Final Report¹ in September 1998. The leaders of the Michigan Public Health Institute and the Michigan Library Consortium met to prepare a systematic exploration phase. The progress of

* This paper was given at the IFLA Conference in Jerusalem, August 2000.

¹ <http://www.cyber-state.org>. See MITC Final Report and health care agenda.

AccessMichigan serves as a key foundational element for serving the health information needs of Michigan's residents and stakeholders. In early 1999, the leadership of Cyberstate.Org, the successor to MITC, began participating in the collaboration. In May 1999 a focus group was held with invited experts from hospital and health sciences libraries, administrators of health care organizations, the Michigan Library Consortium and the Library of Michigan. The focus group produced an enthusiastic consensus for beginning the design of an innovative state-of-the-art health information system for Michigan. The initial direction and goals were enhanced by the diversity of representation on the steering committee appointed to spearhead the drive for the AccessMichigan Electronic Community Health Information Initiative (AMECHII). The steering committee met for three all-day meetings and continued its communication electronically.

The exploration phase crystallized the vision and long-term goals for AMECHII. The steering committee assessed trends in the new information environment, the effects of the changes in healthcare, the revitalized importance of life science research to Michigan's future and the array of technological opportunities. Michigan's strong foundational elements were identified systematically through the Michigan Public Health Institute's concerted effort to bring together librarians and information experts from the entire state, representing organizations serving multiple and diverse constituencies. The steering committee established a consensus and made energetic commitments to build an electronic health information system within Michigan of national and global stature.

Vision and Goals

AMECHII's vision is to improve the health and well being of all Michigan residents by building the capacity to organize and deliver high-quality, reliable and valid health and life science information in ways that are cost-effective and without geographic or economic barriers.

AMECHII's goals, drafted in the exploration phase, are to use technology to improve the health and well-being of all Michigan residents by:

- Expanding and enhancing the AccessMichigan/Michigan Electronic Library by licensing, organizing and delivering comprehensive health and life science information resources;
- Increasing the quality of access to health and life science information resources;
- Increasing Michigan residents' usage of health and life science information resources by providing a gateway to health information;

- Increasing the cost-effectiveness of the delivery of health and life science information throughout Michigan;
- Demonstrating the effectiveness of new collaborative approaches to planning, funding and implementing statewide delivery of health and life science information.

Who Will Benefit?

A Benton Foundation report² states that

A growing number of policymakers, healthcare providers, and consumers believes information resources hold the key to improving the health care system. These advocates say that judiciously collected and effectively communicated information can help professionals provide better care, turn patients into enlightened consumers of health services, and ultimately enable individuals and communities to address some of the root causes of illness before professional intervention is required.

AMECHII's primary beneficiaries will be Michigan residents – students, clinicians, seniors, scientists, government officials, and all health consumers – regardless of geographic location or socioeconomic status, and all institutions and organizations that serve their health-related needs.

How Will AMECHII Work?

A proposed one-year strategic planning process will delineate the information, health, user and technological needs and challenges, ultimately producing a health information architecture consistent with Michigan's emerging information infrastructure emanating from the achievements of Cyberstate.Org, Michigan Virtual University and other key initiatives. The proposed AMECHII strategic planning process is designed to maximize collaboration and consultation among stakeholders, and includes evaluation protocols to assure that its outcomes support Michigan residents as well as the major existing institutional programs. It will produce a precise information architecture and associated deliverables that will lead to full-scale AMECHII implementation. Members of the exploration phase steering committee reached an initial consensus on the main components likely to form the basis of AMECHII.

AMECHII will consist of four major components:

1. Access to major, complete sources of high-quality health information: commercially-produced bibliographic indexes, full-text databases and reference materials, and

² Benton Foundation. 1999. *Networking for Better Health Care: Health Care in the Information Age*. <http://www.benton.org/Library/health/intro.htm>

electronic journals. This category of resources critical to the AMECHII vision, for these are the resources currently accessible to the fewest number of Michigan residents. Today, only the largest academic institutions and corporate environments have electronic access to varying subsets of this category. These resources have experienced explosive growth in both volume and cost. Many publishers/producers offer statewide licensing options that have the potential of widening access appreciably, possibly lowering direct costs, and certainly lowering indirect costs. Using the AccessMichigan model AMECHII will aggressively pursue licensing strategies to obtain terms consistent with its vision and goals.

2. Access to online health information, data and expertise. AMECHII will be the entry point, or gateway, to electronic health information resources for a healthier Michigan. AMECHII will build on existing resources to offer all Michigan residents the health information they need, when they need it. This gateway will have links to Internet resources and will have them well-arranged for easy browsing with options for different categories of users and user needs (e.g., age groups, literacy levels, cultural preferences, etc.). The gateway will facilitate a variety of online community activities such as discussion groups and conferencing areas. As technology continues to develop, AMECHII will explore emerging technologies including video-on-demand, and audio and video capabilities to link consumers with healthcare providers, educators and other sources of knowledge and assistance.
3. Access to Educational Programming and Tools: Sustaining communities of users is key to AMECHII's long-term viability and impact. Learning tools and aids to assist users in effectively using AMECHII's resources will be developed as both integral components of the system and possibly as separate tools that can be used independently or in the classroom, integrated with health-related curricula.
4. Access to Michigan Health Information: Identifying Michigan health information and data about Michigan health services, expertise, programs and products and making such information easily available is important to both Michigan residents and Michigan's global visibility.

Problem Statement

Most Michigan residents--health professionals and consumers--do not have quick, affordable and easy access to high-quality health information, nor is there an information infrastructure in place that will deliver this information.

Health Challenges and Opportunities

Michigan's health indicators, reported annually by the Michigan Department of Community Health,³ show marked improvement in health status in some of the key

³ Michigan Department of Community Health. *Critical Health Indicators 1998*.
<http://www.mdch.state.mi.us/dch/hlpd/trend.htm>

indicators, no change in others, and a movement in the ‘wrong’ direction for obesity and smoking. With a population of 9.7 million, one in every three Michigan families will face a major illness this year. One of every eight Michigan women will contract breast cancer and Michigan remains among the top five states in cardiac and hypertensive illnesses and obesity. There are many health issues of particular importance to Michigan residents for which substantive, high-quality information is currently difficult to obtain for the individual, the healthcare provider, policymakers, researchers or educators. These include resources applicable to minority health, toxicological and environmental health issues and public health information pertinent to specific Michigan locations and populations. The breadth of Michigan’s health issues and ambitions for life sciences research which can be improved and/or affected positively by AMECHII must be identified, selected and prioritized through extensive collaboration and consultation with a wide range of stakeholders.

Managed care has created the largest change in the U.S. health system in this generation. New economic forces of cost-reduction and competition are causing many systemic changes, including influencing the ways health information is delivered to clinicians and consumers. In some unfortunate instances, hospital libraries have been eliminated entirely or their size and personnel reduced resulting in diminished service. Ironically, the recent attention drawn to the Institute of Medicine⁴ report on the number of errors occurring in U.S. hospitals serves to underscore the misfortune inherent in the reduction of library services in the clinical environment. Ready access to data, information and knowledge is assuredly ne of several obvious solutions for reducing errors and improving the quality of care.

Information Challenges and Opportunities

The new information environment offers the opportunity to create a system for equitable and unimpeded access for all Michigan residents to health information resources where and when they are needed. This vision recognizes that the system must accurately reflect Michigan residents’ needs, expectations, demographics, and geographic and economic obstacles. All potential AMECHII users, including minorities, women and persons of limited resources, should have full access to all programs and services. The costs of access to information, including factors such as the monumentally increased costs of access to the highest quality life sciences

⁴ Kohn L, Corrigan J, Donaldson M., eds. 1999. *To Err is Human: Providing a Safer Health System*. Washington, D.C: National Academy Press, Institute of Medicine, Committee on Quality of Care in America. <http://www.nap.edu/books/0309068371/html>

information, the gap between the technological ‘haves’ and ‘have-nots’ relative to technology ownership and technology literacy alike, are beginning to be better understood.

Michigan’s libraries face significant economic challenges, including rapid price escalation of commercially-produced and distributed health and life science information and knowledge, threats to the funding of public libraries, and continuing economic pressures on hospital, academic and corporate libraries to reduce costs. At the same time, there is increased emphasis on, and need for life-long learning, distance education, and demands by library users of all types for more and better information delivered ‘to the desktop.’

With the explosive growth of scientific, technical and medical information available in digital formats (as well, with increasing amounts available solely in electronic form), a major paradigm shift is occurring in information delivery methods. Libraries and other institutions are now able to license these electronic products and deliver to user communities distributed over large geographic areas rather than being limited to those within driving distance of the “warehouse of physical objects” – the print library. In order to maximize and equalize the access Michigan residents have to health care information, it is imperative that Michigan move ahead in developing new strategies to take advantage of these shifts. Michigan librarians are poised to do this, and have already begun the process through the development of AccessMichigan, the Michigan Electronic Library, and the other progressive building blocks forming Michigan’s existing capabilities.

Technological Challenges and Opportunities

Assessing the technological capabilities and potential of Michigan’s vast infrastructure is another exciting challenge for AMECHII. To meet and support AMECHII’s goals and vision, collaboration and cooperation among experts in Michigan’s private and public sectors must ensue. Assessments of the installed base of devices capable of accessing and utilizing AMECHII, selecting optimal, cost-effective routes for connecting to AMECHII, designing the technology and personnel support structure needed, and understanding the technological literacy levels of Michigan residents are critical factors.

User Access Challenges

The format and presentation modes of information resources present barriers in a number of ways. Information created for the scientist and scholar may also, for one example, be of great importance to individuals, teachers, policymakers or the range of health workers. Language levels, ‘readability,’ culturally sensitive and

meaningful presentation are all challenges that will be analyzed and integrated into the design of AMECHII.

AMECHII Project Background

The confluence of unprecedented changes in the information and healthcare environments and the rising tide of Michigan residents' expectations for information access have led to this pivotal moment to commence with the AMECHII strategic plan.

A concerted effort will be required to ensure that the information revolution truly produces a health information system that is more effective, equitable and capable of responding to the following expectations and needs:

- Consistently reliable, scientifically sound and unbiased information sources.
- Trusted gateways to quality information, unaffected by commercial pressures.
- Mechanisms to promote user education and increased information literacy in the service of enabling informed choice.
- Capabilities to deliver information, in effective formats, to the point of decision-making need for both consumers and healthcare providers.
- Enhancement of the consumer-provider relationship to increase shared decision-making.
- Equity in access including reaching disadvantaged persons.
- Community-focused resources that bring together the knowledge and expertise of the medical model and public health practices and needs.

Rising Expectations of Michigan Residents

Michigan is well on the way to being a leading “information” state. Substantial improvements in the individual’s capacity to access information through the state’s technological infrastructure have been made. In the most recent survey, reported in December 1999⁵, 61% of the adults surveyed had used the Internet (with 74% using it at least weekly); this represented a 9% increase from 1998. Sixty-four percent owned at least one computer. Remarkably, only 8% of the respondents had no computer available to them. Michigan ranks 9th among the 50 states in the use of online information technologies by state government, a measure of the fact

⁵ *Information Technology in Michigan: Adult and Teen Survey Report*, sponsored by Cyberstate.Org, http://www.cyber-state.org/adult_teen_survey.pdf

that Michigan's government is embracing the shift to an information-based economy dependent on digital technologies⁶.

The increases in Internet access in Michigan are appreciable. The proposed AMECHII strategic planning process is needed to project the capabilities of the current access infrastructure and to match them with projections of the needs expressed by stakeholders and residents. Such needs extend to reading full-text publications, viewing images or video, or using telemedicine applications such as those supporting home-based health care.

Stakeholder Identification and Analysis

AMECHII systematically and inclusively identifies key stakeholders in Michigan. This process will provide AMECHII planners with a map of stakeholders, their constituencies (potential user populations), interests and needs so that stakeholders can be represented and throughout the strategic planning process. AMECHII will serve multiple constituencies.

AMECHII will design a system that eliminates administrative, technological, and network redundancies with stakeholders appropriately and vigorously engaged. The objective of stakeholder analysis will be to identify the diversity of stakeholders that can be engaged in and served by AMECHII. This will include strengthening relationships with underserved and low-income populations as well as initiating relationships with Michigan's business and industrial communities. The following are general categories of stakeholders:

- Business and industry in the life, pharmaceutical and health sciences
- Business and industry having a stake in the health of their employees and communities
- Health care providers
- Higher education
- Libraries of all types
- Health care consumers
- State government
- Public and private technology sectors

AMECHII Strategic Planning Phase

The strategic planning process will consist of the following elements:

⁶ Progressive Policy Institute, *Technology Project*, <http://207.158.225.143/states/michigan.html>

- Stakeholder Identification and Analysis
- Planning Process Project Administration
- Planning Process Workplan/Timeline
- Planning Process Budget and Methods
- The AMECHII Communications and Dissemination Process
- Development of the AMECHII Project Plan

AMECHII will utilize a strategic planning model that includes a steering committee with subordinate planning teams and a stakeholder advisory committee.

The steering committee will be responsible for oversight, coordination of the strategic planning process, and the communications process. Planning teams will be responsible for each deliverable. The steering committee will draft the deliverables for review by the advisory committee.

Development of the AMECHII Project Plan: Five Deliverables

The strategic planning process will produce the blueprints for implementing governance and collaborative structures capable of assuring its successful development. The exploration phase has produced initial assessments and identification of technological and societal trends. When AMECHII moves into the implementation phase, these assessments and trends will be validated or modified. Each deliverable of the strategic planning process will include:

- A new statewide health information architecture and services, including content and delivery
- Formation of a funding partners coalition, with matching components with specific funder goals and objectives, and development of new economic models for ongoing financial support of the stated information architecture
- Outcome-related goals and objectives
- Outcome measures associated with these objectives
- Priorities for implementation with accountability measures including costs, outputs, results and benefits.

AMECHII Strategic Business Plan

The strategic business plan will recommend an AMECHII governance structure optimized according to AMECHII's concern for collaboration, inclusiveness and strategic partnerships; the plan will define the requirements for AMECHII management, support personnel and processes (e.g, training and education) which will assure evolutionary growth and the ability to sustain the AMECHII

community of users. The business plan will be designed so that it will be attractive to potential funding sources in the public and private sectors alike. Creation of a recommended funding plan with a number of alternative strategies will be an essential component of the business plan. Exploration of sponsorship and a variety of different partnership models will be thoroughly explored.

The plan will define measures of success during the implementation phase; it will also delineate the methods for track progress and reporting results. Successful models of governance, management and funding will be reviewed and adapted.

AMECHII Strategic Technology Plan

Due to the rapidly changing nature of all technological capabilities, the AMECHII technology plan will be strategic rather than operational.

The technology plan will include:

- Leveraging Michigan’s “high tech” infrastructure and technical personnel;
- Selecting technical platforms and tools that can be readily obtained, trained and maintained;
- Increasing the accessibility of health information for diverse populations.

The plan will include baseline and ongoing assessments, of Michigan’s installed base of information networks and computers, and their adequacy to support the AMECHII vision; and assessment of the technical support services needed by Michigan residents. The environment external to Michigan will continue to be scanned during the development of the strategic technology plan.

Harvey Brenneise
Michigan Public Health Institute
2436 Woodlake Circle, Suite 380
Okemos, MI 48864
USA
Hbrenne@mphi.org
517-324-8317
517-324-8327 fax