Information needs of rural health professionals: a retrospective use study*

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To explore the information needs of rural health professionals, a retrospective study was undertaken of 1,224 document delivery requests made during the course of three outreach projects in west and central Illinois. The 547 unique journals from which the articles were requested were analyzed for frequency of request, subject content, and inclusion on core lists. These rural health professionals were found to request current information on a wide range of topics in clinical medicine, nursing, health administration, allied health, social sciences, and basic sciences. While 10% of the titles filled 37% of the requests, 58% of the titles were requested once and filled 26% of the requests. A high correlation with *Abridged Index Medicus* and Brandon/Hill list titles was found, but titles from either of these lists could fill no more than 30% of the total requests. Besides demonstrating the complex information needs of rural health professionals and depicting the difficulty of building a collection to support them, the study exemplifies a method for need-based journal collection development and begins to identify titles commonly requested in a rural health setting.

INTRODUCTION

In the years between 1989 and 1994, the National Library of Medicine (NLM) supported almost 300 outreach projects across the country to disperse information to underserved health care professionals. Part of this effort included a number of Grateful Med demonstration and training projects to reach out to rural, minority, and unaffiliated health professionals [1]. The University of Illinois at Chicago (UIC) Library of the Health Sciences-Peoria (LHS-Peoria) and LHS-Urbana were two of the libraries that conducted NLM-funded outreach projects aimed at rural health professionals. These projects introduced end-user searching and provided document delivery and reference services. Circuit librarian service was an added feature of the Urbana project. LHS-Peoria subsequently conducted a follow-up project to reinforce and extend training and to evaluate the long-term effects of its first outreach effort.

The success of these three UIC projects was initially measured in number of health professionals trained, number of searches conducted, and number of documents delivered during the projects. The ultimate measure of success was continued use of information sources—particularly Grateful Med and Loansome Doc—after the projects ended.

Part of the projects' ongoing outreach effort is to advise these sites on collection development. Although core lists have been used for collection development at small

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health sciences libraries, the document requests received during the first LHS-Peoria project showed a diversity beyond the scope of these core lists. Dorsch and Landwirth [2] analyzed the requests received from eight rural hospitals during this first LHS-Peoria outreach project for patterns that might guide collection development at rural health sciences libraries. Journal requests were analyzed by the requesting user group and publication date. The journals that filled the requests were analyzed by subject matter and inclusion on the Brandon/Hill lists and in *The Abridged Index Medicus (AIM*).

Since the completion of document analysis from the first LHS-Peoria project, LHS-Urbana completed an outreach project [3] that provided 221 documents to three sites, and LHS-Peoria completed a follow-up project [4] that provided 663 documents to ten sites. The study presented here compiled the data from all three UIC projects. Analysis was similar to that conducted by Dorsch and Landwirth: journal requests were analyzed by publication date and the journals requested by subject matter and inclusion on the core lists. The collective data suggest a subset of journals appropriate for the needs of rural health professionals.

LITERATURE REVIEW

Few studies appear in the literature that specifically address the information needs of rural health professionals. Dee and Blazek [5] analyzed the information needs and information-seeking behavior of twelve rural Florida physicians and determined the number, type, and urgency of patient care questions encountered during the study period. This study found that colleagues are the primary source of answers to patient care questions, that physicians have many unanswered guestions, and that the information sources used are not sufficient to answer questions. Bowden et al. [6] mailed a questionnaire to all physicians in five Texas counties to determine differences between physicians who have access to established medical libraries and physicians who practice in remote areas without local access to medical information. The results indicated that differences did exist between the two groups in the use of MEDLINE and libraries; those physicians practicing in remote areas showed a statistically significant lower use of these services. Ely et al. [7] observed differences between the number of questions regarding patient visits asked by urban and rural family physicians and reported that urban physicians and those with the most colleagues in their practice tended to ask more questions.

Several studies have pointed to the importance of convenient and immediate access to collections and services as a factor in health professionals' use of information. Lundeen et al. conducted interviews and mailed questionnaires to study the information needs of rural Hawaiian health care practitioners. Most physicians in their study reported that journal articles were the information source that best met their needs and that personal files or a colleague's collection were the most common places for them to gain access to needed materials. The authors also concluded that essential to improving rural health care information access was "the personal touch-providing a rural health information specialist" [8] for local access and timely service. A survey by Dorsch and Pifalo also pointed to the preference for on-site services. The follow-up survey of participants in the first Peoria project and the Urbana projects found that modest levels of information-seeking activity had been sustained [9]. Urbana participants reported a low level of use of Grateful Med and Loansome Doc, which is consistent with the low level of information-seeking activity experienced during the nonvisiting periods of the circuit librarian during the project. The level of Peoria's post-project information-seeking activity, on the other hand, was quite high. Closer examination of the data, however, revealed that 93% of the document requests were generated by two project sites where intermediaries performed Grateful Med and Loansome searches for the hospital staff.

All of these studies relied on the need for information reported through interviews, surveys, and questionnaires. Analysis of interlibrary loan statistics is an alternative method for identifying areas of information need. Byrd et al. recommended the analysis of interlibrary loan borrowing as a method of collection development for monographs [10]. Other authors also consider interlibrary loan requests for serial literature to be good measurements of what is needed in a collection [11]. Dorsch and Landwirth's document delivery study analyzed journal document requests generated by eight rural hospitals. The analysis found a strong need for administrative, nursing, and allied health information in addition to medical information; many requests came from health professionals other than physicians [12]. The great diversity of requests led the authors to conclude that the small rural hospital could realistically build only a very basic collection and should rely on a service such as Loansome Doc to supplement information needs. Likewise, Borsman suggested that in today's environment of expanding information needs, libraries must "move from the just in case practice of building an on-site collection to the just in time model of providing timely delivery of materials as needed" [13].

Delman described a problem-based approach to journal selection that analyzed medical records and inhouse caseload to identify information problems that needed to be addressed through the journal literature [14]. In a later paper, Delman's problem-based approach was extended to analyzing reference transactions as a means of tailoring collection development to institutional needs [15].

Arguing that recommended lists for hospital libraries are too general, Shelley [16] evaluated the journal

collection of a small hospital library. Shelley's study recorded in-house journal use and interlibrary loan requests for six months. A comparison of the use study to the Brandon/Hill list revealed that the Northside Medical Center hospital library used only thirty-five journals on the list. Shelley concluded: "Recommended lists for hospital libraries were found to be too general, for the journal collection should be a reflection of the hospital's departments and it is only through a use study that the collection can be tailored to meet the needs of the staff." Lancaster also stressed the observation that use studies are best for determining journal needs, noting that standard lists concentrate on the most obvious collection choices, and are therefore of limited use [17]. Bader and Thompson designed a program for the measurement of in-house journal use to systematically identify the core group of journals that faculty, staff, and students were reading. Cost was evaluated against the number of uses for a given title [18]. Joswick and Stierman called it the "core list mirage" when a comparison of the journals frequently consulted by faculty and students in their institution turned out dissimilar, and stressed that local rather than national data should be the basis of collection development decisions [19].

METHOD

The document requests from the three UIC projects collectively comprised a base of requests from five calendar years and fifteen unique institutions in west and east central Illinois. The institutions were eleven hospitals ranging in number of beds from 18 to 166, two public health departments, a free community health clinic, and a community health agency. Requests for documents made during the course of all three projects were transmitted by Loansome Doc or recorded on special forms designed for processing requests and maintaining statistics. During the first Peoria project, 359 document requests were received, and all but six were for journal articles. The remaining 353 items were for 201 unique journal titles. During the Urbana project, 221 document requests were received. Of these, thirteen were either unusable or not for journal articles. The remaining 208 items were from 129 unique journal titles. During the second Peoria project, 663 journal articles were requested and came from 357 unique journal titles. The combined total of usable requests was 1,224, and the combined total of unique titles was 547. The requested items from each project were sorted by journal title. The number of articles requested from each title and the publication years for the requested articles were recorded.

For the subject analysis, the Medical Subject Headings (MeSH) for each title were found in SERLINE. An element that was helpful in determining a single subject heading for each title was the "JD" field in SER- Information needs of rural health professionals

Times requested	Articles requested (% of total requests)		
5 or more	455 (37)		
4	104 (8)		
3	144 (12)		
2	206 (17)		
1	315 (26)		
	5 or more 4 3		

LINE, which is used to create the subject listing in the *List of Journals Indexed in Index Medicus*. The few titles not found in SERLINE were incorporated into the subject arrangement with headings suggested by the 1996 edition of *Ulrich's International Periodicals Directory*. Consistent with certain medical titles having a subject heading of medicine and others having a clinical specialty, nursing titles were sometimes assigned to clinical subjects and other times to a general subject heading of nursing. For instance, *Critical Care Nurse* was placed with other titles on critical care. Once the headings for each title were decided, the titles were then grouped into categories suggested by MeSH and the MeSH tree structures.

Each title was checked for *AIM* status and inclusion on any of the three Brandon/Hill lists. Index titles on the Brandon/Hill lists were excluded in the calculations comparing the requested articles and the lists. The editions of the Brandon/Hill lists current during the first Peoria project were used for all comparisons to achieve uniformity [20–22].

Current subscription costs for the frequently or universally requested journals were obtained from the 1996 Ulrich's International Periodicals for the Health Sciences and 1996/97 EBSCO's Periodicals for the Health Sciences and Librarians's Handbook. Superseded titles were calculated at the cost of the current title. For this analysis, a superseded title was listed with the cost for its continuation title.

RESULTS

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From the analysis of the number of requests for each unique title, it was learned that 37% (455/1224) of the articles requested came from fifty-five titles representing 10% of the unique titles requested. Twenty-six titles were requested four times, forty-eight were requested three times, and 103 were requested twice. Three hundred fifteen journal titles, representing 58% of the total unique titles were requested once and filled 26% of the total article requests. Thirty titles were found to be requested in all three projects (Table 1).

Most of the requested articles dated from the most recent five years. Different five-year ranges were used to

Table 2

Subjects of the unique titles requested

Ranked by number of unique titles		Ranked by number of articles			
Medicine	51	Medicine	164		
Psychiatry	44	Nursing	144		
Nursing	43	Psychiatry	79		
Surgery	27	Hospitals	47		
Pharmacology	25	Education	45		
Hospitals	20	Health services administration	43		
Obstetrics	20	Pharmacology	43		
Health services administration	19	Surgery	42		
Environment and public health	18	Obstetrics	41		
Health care-access and quality	18	Anesthesia	38		
Neurology	18	Critical care	38		
Pediatrics	15	Health care—access and quality	36		
Critical care	14	Respiratory tract diseases	36		
Economics	14	Pediatrics	35		
Medical oncology	14	Geriatrics	32		
Diagnostic imaging	13	Environment and public health	30		
Musculoskeletal diseases	13	Cardiology	29		
Nutrition	13	Neurology	24		
Cardiology	12	Nutrition	23		
Education	12	Medical oncology	22		
Geriatrics	11	Economics	21		
Gastroenterology	9	Musculoskeletal diseases	19		
Infectious diseases	8	Occupational medicine	19		
Rehabilitation	8	Diagnostic imaging	18		
Anesthesia	7	Rehabilitation	15		
Computers	7	Computers	13		
Endocrinology	7	Ethics	13		
Health care—facilities, manpower, and services	6	Gastroenterology	13		
Pathology	6	Health care—facilities, manpower, and services	12		
Respiratory tract diseases	6	Infectious diseases	12		
Social sciences	6	Biology	8		
Dentistry	5	Dentistry	8		
Occupational medicine	5	Endocrinology	8		
Sports medicine	5	Pathology	8		
Ethics	4	Social sciences	6		
Biology	3	Urology	6		
Hematology	3	Microbiology	5		
Otology	3	Podiatry	5		
Chemistry	2	Sports medicine	5		
Dermatology	2	Dermatology	4		
Hypersensitivity	2	Hematology	4		
Microbiology	2	Chemistry	4		
Ophthalmology	2				
Podiatry	2	Otology Hypersensitivity	3		
			2		
Urology	2 1	Ophthalmology	2		
Science	1	Science	1		

be consistent with the timing of each project for this analysis. In the first Peoria project, the rate for articles published in the most recent five years (1987–91) was 81%. The rates were 90% and 91% for the Urbana (1988–92) and second Peoria (1991–95) projects, respectively.

The subject analysis based on the unique titles resulted in 147 subjects, which were then grouped into forty-six categories. Medicine, psychiatry, nursing, surgery, pharmacology, hospitals, obstetrics, health services administration, environment and public health, health care access and quality, neurology, and pediatrics accounted for 58% of the unique titles. The number of articles requested from the unique journals in each subject category showed a slightly different pattern. Medicine, nursing, psychiatry, hospitals, health services administration, pharmacology, surgery, obstetrics, and health care access and quality appear in some cases in different order. Education, anesthesia, critical care, and respiratory tract diseases replace environment and public health, neurology, and pediatrics. The top subjects analyzed by articles requested account for 65% of the total articles (Table 2).

Comparisons with core lists were made. Seventy-five percent of *AIM* titles were requested (89/119). However, these *AIM* titles filled only 29% of document needs (356/1224). Sixty-seven percent of Brandon/Hill medical titles were requested (91/135) and filled 30% of document needs (367/1224). Sixty-five percent of Brandon/Hill medical first choice titles were requested (36/55), but filled only 16% (200/1224) of document requests. Fifty-four percent of Brandon/Hill nursing titles were requested (40/74) and only 17% (13/76) of Brandon/Hill allied health titles were requested.

The cost analysis of the titles revealed four pairs of

title changes that necessitated adjustments to the list of titles requested five or more times. A list of journals commonly requested by rural health professionals was compiled (see the appendix). It contains those titles requested in all three projects and those requested five times or more, either as a unique title or as a title change pair. The total subscription cost for sixty of these sixtyone titles is \$9,414.01. A fixed subscription cost for *Progress in Clinical and Biological Research* could not be found.

DISCUSSION

This use study represented journal article requests spanning five years from health professionals at fifteen institutions. The journals containing the requested articles were analyzed by frequency of request, subject matter, inclusion on core biomedical journal lists, and costs. The articles requested were analyzed by publication date and subject matter, according to the subject of the journal title.

Subject analysis showed an overwhelming need for clinical information on the part of all types of health professionals. Seventy-nine percent of the unique titles (433/547) were clinical in nature, covering medicine, nursing, and allied health. Within the clinical category, 8% of the titles could be classified as distinctly concerned with nursing. Document delivery records from the projects showed that physicians were only a small group of requesters while nurses, allied health professionals, administrators, and other hospital staff accounted for the majority of document delivery requests. The journals from which information was requested did not mirror the professional affiliation of those using the information, revealing the interdisciplinary information needs of health care professionals and a shared body of literature. The clinical nature of the majority of titles in this study suggests that the mid- to large-size hospital library is as suited as the academic library to serve as a resource library. Health administration titles accounted for 18% (96/547) of the journals requested. This strong need for health care administration titles may reflect the increasing reliance on information in today's competitive health care industry. An "other" category, encompassing the pre-clinical and social sciences, made up 3% (18/547) of the requested titles, emphasizing again the interdisciplinary and diverse information needs of health care professionals.

The data showed that health professionals in this study required the most current literature, which was also reflected in their use of Grateful Med during the projects. Even though MEDLINE back files were available to project participants, they were used infrequently. These findings would not support the maintenance of journal back files of material more than five years old in small health sciences library collections. Online full-text databases and electronic journals, with their emphasis on the most current literature, hold the potential for small collections to solve both access and retention issues, but this option will not reduce costs. Subscriptions and costs for associated resources such as hardware, communications, and systems maintenance may actually increase expenses. Kane believes that cancelling print subscriptions in favor of accessing them on the Internet will not eliminate the problem of soaring subscription costs [23]. In a *College and Research Libraries* guest editorial William Miller stated: "All available information indicates that electronic access will increase costs. Publishing is a business, and will remain one as we move into the electronic age" [24].

Comparison with the core list titles showed that 75% of *AIM* titles, 67% of Brandon/Hill medical, 54% of Brandon/Hill nursing, and 17% of Brandon/Hill allied health titles were requested. Although the core list journals would have filled only 29% to 30% of document needs, it is significant that so many of the core list titles were requested. The data support the usefulness of these lists as a general guide or standard in collection development decisions for small health sciences libraries, consortia, and resource libraries. In the introduction to the 1995 Brandon/Hill medical list, the authors conceded that as the cost of books and journals continued to rise, facilitating cooperative resource sharing was fast becoming the primary use of the list [25].

The data in this use study, based on the actual needs of health professionals in a group of rural hospitals and institutions, served as a basis for compiling a list of titles for a basic collection in the health sciences library, consortium, or resource library serving the needs of rural health professionals. Titles requested five or more times or requested in all three projects were included. The collective nature of the data may be a limitation with respect to an individual library because it represents fifteen institutions spanning five years.

Discussions of "access" versus "ownership" abound today as libraries of all sizes become incapable of collecting all the materials that would fill the needs of all patrons. The authors agree with Kane's balanced compromise of a collection based on "access" and "ownership" [26]. Although the small institution may have to rely more heavily on "access," it is desirable that these institutions maintain some "ownership" to meet as many information needs as possible in an immediate manner and to provide browsing and current awareness convenience. These institutions may benefit from informed collection development decisions based on a process that takes many factors into account. Core lists may guide these decisions by providing a standard measure. A list of recommended titles based on actual information needs of a given population, such as the one produced in this study, can provide additional data for informed journal collection decisions.

The method used in compiling the list in this study can be replicated by any institution in creating its own

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need-based list of journals. The first step is identifying journal needs by using data such as in-house journal use, interlibrary loan activity, and document delivery requests. Second, core lists should be consulted to provide a standard for comparison. Finally, although this study was unable to figure cost per use because the data were distributed over fifteen institutions and five years, subscription cost and cost per use should be factored into the equation to answer the question of which titles can provide a reasonable percentage of total information needs at a reasonable cost.

CONCLUSION

Several patterns emerged in this analysis of documents requested during three outreach projects in central Illinois. The overwhelming need for the most current clinical information was expected, but there was also a significant need for health administration information. There was a diversity of requests that pointed to sophisticated information needs spanning clinical medicine, nursing, health administration, allied health, social sciences, and basic sciences. The titles demonstrate a breadth of information needs that cannot realistically be met by local collections because of economic restraints. The study shows the difficulty of building a collection to support the information needs of rural health professionals, and suggests that small institutions may have to rely heavily on document delivery and resource sharing to meet information needs. Electronic formats are promising for more immediate access, but costs remain a barrier.

Comparison of the titles in this study to *AIM* and the Brandon/Hill list titles validates the use of these lists in collection development and further refines them from a rural perspective. The frequently and universally requested titles in this study begin to identify a core of journals for rural health sciences libraries, consortia, and resource libraries serving unaffiliated health professionals in rural or remote areas. The method used in compiling the list may also serve as a model for need-based collection development. Health sciences libraries, in particular those with minimal collection budgets, may benefit from conducting similar use studies to make need-based collection development decisions.

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APPENDIX

Journals commonly requested by rural health professionals

Journal title	Times/request	All projects	AIM	B/H	Cost
AAOHN Journal	9	x	Α	N	70.00
American Journal of Cardiology	6		Α	М	160.00
American Journal of Diseases of Children	5	х	Α	М	140.00
merican Journal of Hospital Pharmacy	4	х			141.00
merican Journal of Medicine	13	x	Α	M*	125.00
merican Journal of Nursing	7	x	Â	N*	45.00
	8	^	Â	M*	
merican Journal of Obstetrics & Gynecology					247.00
American Journal of Psychiatry	5	v	A	M*	100.00
Merican Journal of Public Health	6	x	A	M*	160.00
merican Review of Respiratory Disease	6			M*	220.00
nesthesia and Analgesia	11		Α		253.00
Inesthesiology	12		Α	M*	220.00
nnals of Emergency Medicine	7	Х	Α	M*/H*	123.00
nnals of Internal Medicine	12	Х	Α	M*	139.00
nnals of Thoracic Surgery	7		Α	М	250.00
rchives of Internal Medicine	8	Х	Α	M*	145.00
MJ	4	х	Α	М	467.37
ritish Journal of Anaesthesia	9				258.54
ritish Journal of Obstetrics & Gynaecology	5		А	М	229.00
hest	21	x	Â	M	150.00
Virculation	6	x	Α	M*	236.00
Computers in Health Care	5				34.00
ritical Care Medicine	10	х	Α	M	190.00
eriatric Nursing	6			N*	58.00
erontology .	6				356.60
IEC Forum	7				162.00
lospital Progress	4				40.00
lealth Progress	1				
lospitals	7		Α	M*	65.00
lospitals and Health Networks	5				
nquiry	4	х			70.00
AMA	16	x		M*	160.00
	8	^			
ournal of Advanced Nursing				N	528.00
ournal of Ambulatory Care Management	5				128.75
ournal of Clinical Psychopharmacology	5				174.00
ournal of Continuing Education in Nursing	9			N	75.00
ournal of Family Practice	5	Х	A	М	150.00
ournal of Nursing Administration	13	Х	Α	N*/M*	175.00
ournal of Nursing Quality Assurance	3				94.75
ournal of Nursing Care Quality	2				
ournal of Nursing Staff Development	16			Ν	145.00
ournal of Psychosocial Nursing & Mental Health Services	5			N	58.00
ournal of American Academy of Nurse Practitioners	5				55.00
ournal of the American College of Cardiology	5	v	Α	м	198.00
		X X	~		
ournal of the American Dental Association	4	^		М	105.00
ournal of the American Geriatrics Society	5				209.00
ournal of the Kentucky Medical Association	5				25.00
ournal of Urology	5		Α	M	293.00
ancet	20	х	Α	M*	250.00
layo Clinic Proceedings	3	х	Α		72.00
ledical Care	8				274.00
lodern Healthcare	6				110.00
lew England Journal of Medicine	10	х	Α	M*	170.00
lursing	9			N*/M*	42.00
ursing ursing Clinics of North America	9 7	x	Α	N*	85.00
	14	â	~	N	34.00
lursing Management					
lursing Times	18	x	•	N	173.00
bstetrics & Gynecology	5		A	M	232.00
ediatrics	7	X	A	M*	175.00
ostgraduate Medicine	11	х	Α	M	59.00
rogress in Clinical and Biological Research	6				n.a.
RB: Quality Review Bulletin	7	х			115.00
oint Commission Journal on Quality Improvement	2				
	5				155.00
uicide & Life-Threatening Behavior			-		
uicide & Life-Threatening Behavior	6	Х	Α		40.00

m = Brandon/Hill medical list
N = Brandon/Hill nursing list
H = Brandon/Hill allied health list
* = Brandon/Hill select titles
n.a. = Not Available