

Trends in reference usage statistics in an academic health sciences library

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Purpose: To examine reference questions asked through traditional means at an academic health sciences library and place this data within the context of larger trends in reference services.

Methodology: Detailed data on the types of reference questions asked were collected during two one-month periods in 2003 and 2004. General statistics documenting broad categories of questions were compiled over a fifteen-year period.

Results: Administrative data show a steady increase in questions from 1990 to 1997/98 (23,848 to 48,037, followed by a decline through 2004/05 to 10,031. The distribution of reference questions asked over the

years has changed—including a reduction in mediated searches 2,157 in 1990/91 to 18 in 2004/05, an increase in instruction 1,284 in 1993/94 to 1,897 in 2004/05 and an increase in digital reference interactions 0 in 1999/2000 to 581 in 2004/05. The most commonly asked questions at the current reference desk are about journal holdings 19%, book holdings 12%, and directional issues 12%.

Conclusions: This study provides a unique snapshot of reference services in the contemporary library, where both online and offline services are commonplace. Changes in questions have impacted the way the library provides services, but traditional reference remains the core of information services in this health sciences library.

INTRODUCTION

The introduction of end-user search systems beginning in the late 1980s initiated a wave of change at the traditional reference desk as users began to use library services in new ways. With the introduction of end-user MEDLINE in the 1980s, many libraries found an increase in requests for individualized instruction, technical assistance, and in-depth reference [1, 2]. With new information resources available, library users appeared to find reference services helpful in adapting to this newly emerging information landscape. Not surprisingly, however, increasing electronic access for users has also meant a decline in some areas of traditional reference service, such as mediated searching [3]. These trends have continued as remote access to resources has expanded.

A 1995 survey examining University of Illinois at Chicago (UIC) health sciences faculty's uses of library resources found that more than half of the faculty accessed Grateful Med from their offices, and over 20% accessed library resources from home [4]. In 2003, De Groote and Dorsch found that 95% of the students, faculty, and residents reported having access to a computer with Internet access outside of the library, and 53% percent of these users reported that they searched MEDLINE at least once a week [5]. This study also found that only 16% of users depended entirely on the library to access its online resources, while 39% of users never entered the library to access online resources. With today's increased availability of online journals,

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Highlights

- A decrease in directional questions and mediated searching and an increase in in-depth reference and consultations were observed. Ready reference questions have remained a consistent proportion of all questions asked.
- In spite of increasing online access to both information resources and library services, more users access reference services at the library reference desk than they do online.
- The total number of reference questions has disproportionately decreased despite the availability of online services, indicating a large gap between the questions once asked at the reference desk and the questions now asked either online or in person.

Implications

- Librarians need to more fully explore the needs of their local target user populations to ensure they are effectively reaching users who are no longer coming into the library.
- More research is needed on the preferences of both traditional and online library users, in order to find the most effective balance of on-site, outreach, and online reference services.

the above finding is likely to be even more pronounced. If users do not need to come to the library to access information, it can be assumed that there is less motivation for them to come to the library to ask questions about how to find that information.

Table 1
Reference question definitions

Directional questions

Questions regarding location of services, policies, collections and materials contained in the building or university. Example: Where are the restrooms?

Ready reference questions

Questions that can be answered quickly, usually in five minutes or less.

In-depth reference questions

Questions that require more than approximately five minutes to answer and/or involve the use of several resources.

Consultations, demonstrations

Includes scheduled demonstrations of one or more print or online resources or in-depth consultation sessions or conducting research on a project or topic; may be individual or small group.

In response to falling entrance statistics and increasing online collections, libraries have reached out to patrons in new ways. These many changes have encouraged additional reevaluation of traditional reference services and initiation of new programs and services [6]. For example, users now may choose to request assistance from librarians through digital reference services. Recognizing the decreasing numbers of questions being asked, some libraries have consolidated multiple service points to provide “one-stop” assistance, decrease user confusion about where to go for help, and optimize staff resources [7, 8]. Other libraries have trained paraprofessionals to work at the reference desk [9]. Both approaches allow librarians to focus more time and effort on instruction, outreach, and online initiatives.

Changes in resources have also moved libraries to reconsider how they quantify reference services. As Warner points out in a study of the East Carolina University library’s reference statistics classification system, traditional categories—directional, ready reference, or search/instructional—are somewhat vague and understood by different staff to mean different things [10]. E-resources especially tend to blur lines: does a question become a search if a ready reference question is answered electronically? A more thorough understanding of the types of users and questions asked at the reference desk may aid in making difficult decisions about services and staffing.

The University of Illinois at Chicago (UIC) Library of the Health Sciences (LHS)

In the fall of 2004, librarians in the Information Services Department at the University of Illinois at Chicago (UIC) Library of the Health Sciences changed the physical layout of their traditional reference service points. For eight years, reference services had been divided between an Information Desk, where paraprofessionals answered directional and ready reference questions, and a Research Consultation Office, where librarians provided more in-depth research assistance and point-of-need instruction. This service model was implemented in order to triage an overwhelming number of user questions in the early 1990s—likely associated with the increased availability of end-user searchable information resources—and to free librarians’ time for new outreach activities and curriculum-integrated instruction. More recently, however, librarians

have observed a decrease in reference questions [11]. In order to increase the visibility of librarians within the library building, the department merged reference service points into a single Reference Desk. Paraprofessionals continue to answer directional, holdings, and ready reference questions, while the librarian on duty at the desk fields in-depth questions. This change in service led to a more comprehensive exploration of who is currently using traditional reference services and what questions they are asking.

Little current literature is available on the latest trends related to the use of the traditional health sciences reference desk. As libraries move forward with new electronic resources and online services provided at the point of need, it is useful to have a more comprehensive understanding of how these changes have impacted the use of traditional reference services and what they might tell us about library users, both in-house and virtual. This understanding may inform services provided within the library and possibly elucidate some of the needs of remote users. This paper examines user questions asked at the current health sciences reference desk of the UIC LHS in comparison to the questions asked before many library resources became available online and places this data in the context of long-term trends in reference service use.

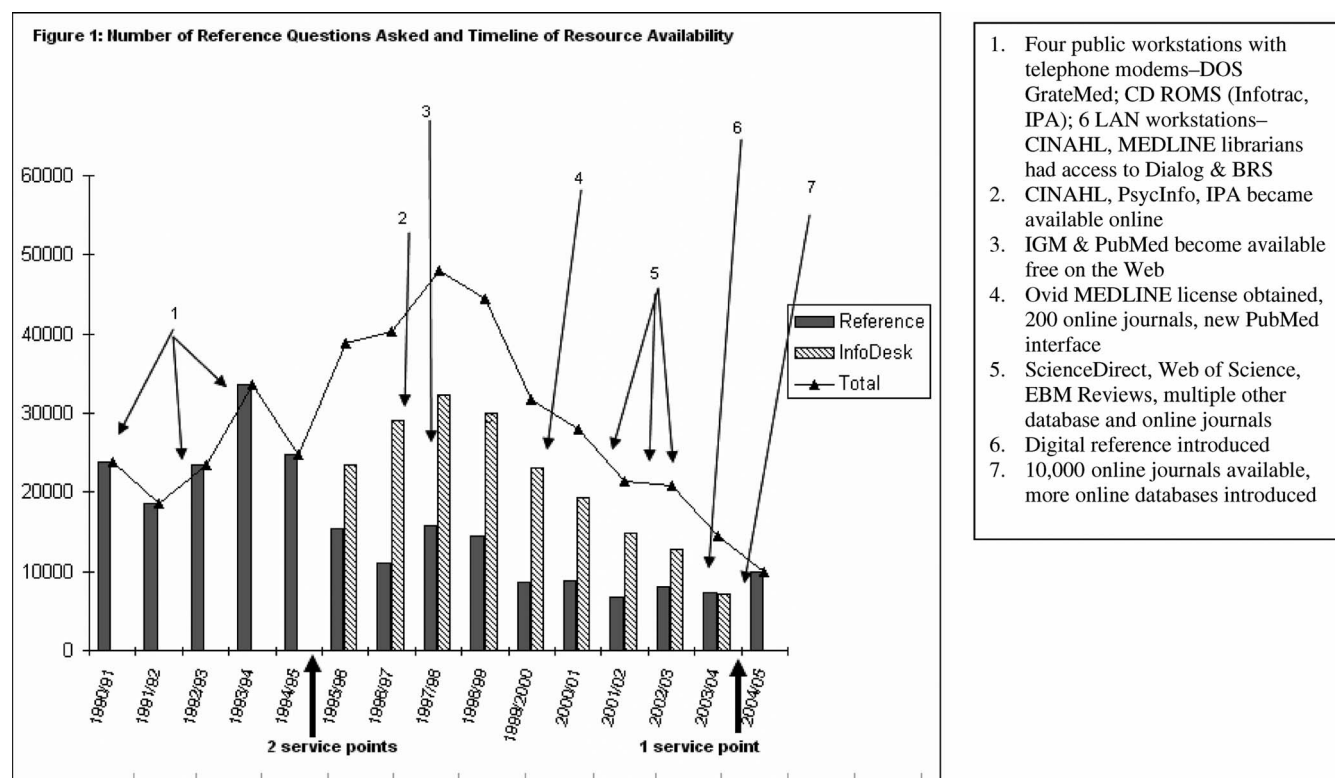
METHODOLOGY

Quantitative and qualitative data were used to assess changes in health science reference questions and the resulting impact on the configuration of reference services.

Quantitative administrative data are regularly collected on the number of reference questions asked and include the service point, type of patron, and query category (Table 1). Data collected from 1990 to 2005 were entered into a spreadsheet.

Qualitative data were gathered on reference questions asked during two-week periods in November 2003 and November 2004. Following a training period, staff used an online form to code each reference question asked, indicating category of user, mode by which questions were received (in-person, phone), subject area, staff answering the question (librarian or paraprofessional), type of question, and how the question was answered. Definitions of categories were provided on the form. Data were entered into a spreadsheet to

Figure 1
Number of reference questions asked and timeline of resource availability



determine frequency and analyzed using SPSS statistical software.

RESULTS

Quantitative (administrative) data analysis

Figure 1 shows the total number of reference queries answered by staff either in-person or over the phone over a 15-year period. There was a steady increase in questions from 1990 to 1997, followed by a decline beginning in 1997/98. Academic year 1995/96, when the Information Desk was introduced, coincided with a large increase in questions from the previous year. From 1995/96 to 2002/03, the Information Desk handled the majority of questions, but by 2003/04, approximately 200 more questions were asked in the Research Consultation Office than at the Information Desk. Figure 1 also illustrates that following the initial introduction of end-user searchable databases, the number of reference questions decreased as the number of databases increased.

Appendix 1 reflects the types of questions asked from 1990 to 2005 of reference department staff, either in person, over the phone, or online (e-mail or chat). In 1995/96, when the Information Desk was introduced, the number of directional, ready reference, and "other" questions answered by reference librarians greatly decreased compared to the previous year (22,430 in 1994/95 to 13,837 in 1995/96), while the number of in-depth reference questions increased (887

in 1994/95 to 933 in 1995/96). Beginning in 1999, the number of directional and ready reference questions answered by librarians generally remained constant (~ 4,500 each year), but questions answered in these categories by Information Desk paraprofessionals continually declined (6,000 in 1999/2000 to 2,000 in 2003/04). The number of mediated searches decreased from 154 in 1997/98 to 4 in 2002/03, while the number of digital reference questions increased from 0 in 1997/98 to 581 in 2004/05. The number of consultations/demonstrations decreased noticeably in 1995/96 from previous years, while the number of library seminars and workshops offered increased. Appendix 1 also shows that the gate count increased until 1997/98 (653,940), after which it began to decline precipitously (148,687 in 2003/04).

Qualitative (in-depth) data analysis

In the 2-week time periods in 2003 and 2004 during which detailed data were collected, staff answered a total of 1,158 queries (Table 2). The majority of questions were asked in person (85%, $n = 983$) by students (total 51%, $n = 586$; including 23% undergraduate, $n = 266$, and 28% graduate, $n = 320$). Faculty asked 22% ($n = 252$) of questions, while visitors asked about 23% ($n = 271$) of questions. Questions over the phone were most often received from faculty (35%, $n = 62$) and individuals unaffiliated with UIC (33%, $n = 57$).

The most commonly asked questions were about

Table 2

Method of question submission to the reference desk by user group, November 2003 and November 2004

	Faculty/Staff	Undergrad	Graduate	Non-UIC	Alumni	Unknown	Total
Phone	62 (35%)	24 (14%)	20 (11%)	57 (33%)	2 (1%)	10 (6%)	175 (15%)
In-Person	190 (19%)	242 (25%)	300 (30.5%)	202 (20.5%)	10 (1%)	36 (3.7%)	983 (85%)
Total	252 (22%)	266 (23%)	320 (28%)	259 (22%)	12 (1%)	46 (4%)	1,158 (100%)

Note: Totals between tables vary due to missing data in some cases.

journal holdings (19%, $n = 216$), followed by book holdings (12%, $n = 137$) and directional questions (12%, $n = 140$) (Table 3). Only 0.4% ($n = 5$) of questions were about consumer health information. Questions falling into the "other" category also accounted for a large number of questions (17%, $n = 194$). Based upon librarians' experience at the new desk, categories specific to printing and requests for office supplies were created in the second year of coding, which most likely led to the decreased number of "other" questions (Table 3). Printing questions accounted for more than 10% ($n = 50$) of the questions asked.

Types of questions asked at the two service desks were compared (Table 3). Overall, the total number of questions decreased from 2003 to 2004, although the number of directional and research consultation questions increased. The number of questions answered by librarians increased, while the number of questions answered by paraprofessionals decreased.

DISCUSSION

Study findings in context

The core user group and question categories in this study are similar to those of previous studies, although the proportions vary [10, 12–15]. Certain categories, such as directional and "other" questions (technical, printing), while still representing a large percentage of the questions asked, are most likely declining as a result of fewer people entering the library.

A number of studies from which reference trends can be extrapolated have examined the types of questions asked during the time period when end-user search systems were introduced (Appendix 2). Ready reference questions were most frequently asked, followed by directional and other types. Requests for mediated searching or instruction were the smallest categories, with search requests declining significantly in recent years. Additionally, most reference questions were asked by users affiliated with the institution; students were the heaviest reference users. Changing technologies, different libraries, and different coding systems further complicate comparisons of the types of questions asked at academic health sciences libraries in the past and present.

The basic administrative data collected by most libraries do not elucidate the specific types of questions asked. As libraries move forward with new electronic resources and online services provided at the point of need, it is useful to have a more comprehensive understanding of how these changes have impacted the use of traditional reference services and what they

might tell us about library users, both in-house and virtual. This research gives a useful comparison and framework for analyzing current reference desk statistics and contributes to a more complete picture of reference trends, which may assist libraries in better planning for the future.

Implications

The literature review and statistics from both the retrospective quantitative analysis and the current qualitative analysis imply that as users have become more sophisticated information seekers, their demands of librarians have evolved to require more instructional and in-depth assistance rather than traditional ready reference questions. This shift demonstrates a continued, and perhaps even stronger, demand for skilled and knowledgeable reference librarians who can evolve in response to user needs. However, there is also a large proportion of directional and ready reference questions asked at the reference desk that do not necessitate that a librarian be continually at the desk. Finding a way to refer appropriate questions to skilled librarians in a timely and seamless fashion may be more appropriate than having a librarian always present at the reference desk. Providing skilled staffing at the reference desk is a necessity, but having the expertise of the librarians "just-in-time" maybe a more appropriate use of librarians' skills, freeing up their time for activities such as outreach and online instructional development.

Ensuring that the needs of the remote users are also being met is a factor raised from these study findings. Although digital reference lends itself to providing assistance to the remote user, the physical library is still the place where most questions are asked. Digital reference questions have increased at LHS, but the total number of reference questions has disproportionately decreased, indicating a large gap between the questions once asked at the reference desk and the questions now asked (either online or in person). While in-depth and instructional questions appear to represent a larger percentage of the types of questions asked through digital chat or email compared to in-house reference, the use of digital reference services by remote users in the academic health sciences library is not overwhelming [16]. More in-depth study is required to determine the needs of the remote user and whether these needs are being met. This is especially true within the health sciences, given that one study found the ratio of remote users to in-house users of academic health science libraries is 5:1, compared to

Table 3
Types of questions asked at the reference desk in November 2003 and November 2004

	Finding articles or info on "X"		Research consultation		Database mechanics		Accessing e-journals or e-re-sources		Book or other material holdings		Factual or statistical questions		Technical/ accessor issues/complaints		Directional questions		Questions about the OPAC		Policies/ services verification		Citation verification		Other		Printing		Requests for supplies (pen, paper, stapler)		Total
	54	42	17	20	27	26	135	102	10	43	57	5	53	3	158	50	682												
2003 total	42	17	20	27	26	135	102	10	43	57	5	53	3	158	50	682													
2004 total	96	26	47	20	17	81	46	11	25	83	4	23	3	36	16	474													
All years	96	26	47	20	17	216	148	21	68	140	9	76	6	194	50	1,156													
Percent	8.3%	2.2%	4.1%	4.1%	3.7%	18.7%	12.9%	1.8%	5.9%	12.1%	0.8%	6.6%	.5%	16.8%	4.3%	100%													

Note: Totals between tables vary due to missing data in some cases.

1.3 remote users for each in-house user at "main" academic libraries [17].

A valid question raised by this study is what regular reference statistics are in fact revealing. The detailed statistics collected just before and after the installation of the new reference desk give a much better snapshot of reference services and users than the basic transaction statistics collected throughout the year. The basic statistics may sometimes be misleading, as over the years changing librarians on staff no doubt have had different interpretations of "in-depth" and "ready reference," especially in light of changes in methods of answering questions. While it would be unreasonable to collect such detailed data as this study provides for every reference transaction year-round, and while a change in classification would make comparison over time difficult, adaptations in reference statistics collection may make future planning and evaluation more fruitful.

Study limitations

Being able to compare the recent qualitative data to qualitative data obtained from the same institution from the years prior to and during the introduction of end-user databases would have strengthened the ability of this study to ascertain the patterns of change outlined in this study. The quantitative data analysis also has its limits as different librarians and paraprofessionals recorded the data over the years, bringing individual variation into determining the status of a question. The data collected for this retrospective analysis was influenced by staffing patterns, physical setting, and resource availability unique to this institution, which also limits the validity of comparing the results from this institution with the results of past studies. Although many of the results are comparable with past studies, it is difficult to ascertain their current generalizability to other health sciences libraries. However, the ability to trace trends in reference services over time, even at a single institution, still highlights those trends over time and the importance of assessing both use and usefulness of services and adapting accordingly.

An aspect not directly examined in this study is the effect of staffing patterns upon reference services and usage. The physical changes in reference services have been influenced by and affected staffing, and further study is warranted to examine more closely any correlations with data obtained through this study. Especially in the environment of constrained budgets, any conclusions drawn from such a study could assist with making choices in terms of balancing librarian and paraprofessional staffing, as well as weighing the needs and practical capabilities of library staff against those of users.

CONCLUSIONS

The physical reference desk has had many different incarnations, but in the midst of continued changes in users' needs, expectations, and habits, it remains a

central facet of public service in the health sciences library. The skills required to deal with the varied directional, technical, instructional, and in-depth questions related to the diverse, multiple, and ever-growing number of databases demands the time of savvy and up-to-date information professionals. The responsibilities of and opportunities for reference librarians have evolved greatly with the growth of remote access to online databases and electronic journals. An increase in electronic resources has resulted, however, in less physical library use by patrons. In recent years, as more library users have accessed resources from remote locations, the number and types of questions asked at the library reference desk have changed accordingly. Many librarians have perceived a need to reduce time at the reference desk in order to increase outreach, curriculum-integrated instruction, and online instruction. The need for the reference librarian and reference desk remain valid, but because of fewer patrons coming in to the library, these skilled professionals also need to investigate ways to be more immediately relevant to their users, especially those in the ever-growing digital library community. Librarians' time and energy should be used in the most effective and efficient manner possible. The study of reference statistics can provide evaluation data to inform allocation of staffing resources.

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Appendix 1

Type of questions asked by service point

	1990/91	1991/92	1992/93	1993/94	1994/95	1995/96	1996/97
Reference							
Directional	4,260	2,783	5,833	11,591	8,978	3,738	3,381
Ready reference	13,990	10,877	11,145	13,346	9,735	5,449	5,894
In-depth reference	871	472	229	851	887	933	453
Consultation/demo	2,486	3,289	2,815	2,960	991	300	0
Other	84	0	2,566	4,192	3,717	4,650	551
Mediated	2,157	1,104	871	632	395	298	855
Digital reference	0	0	0	0	0	0	0
Total	23,848	18,525	23,459	33,572	24,703	15,368	11,134
Information desk							
Directional	—	—	—	—	—	4,823	6,676
Ready reference	—	—	—	—	—	13,942	17,725
Other	—	—	—	—	—	4,614	4,716
Total	—	—	—	—	—	23,379	29,117
Reference and info desk combined							
Directional	4,260 (17.9%)	2,783 (15%)	5,833 (24.9%)	11,591 (34.5%)	8,978 (36.3%)	8,561 (22.1%)	10,057 (25%)
Ready reference	13,990 (58.7%)	10,877 (58.7%)	11,145 (47.5%)	13,346 (39.8%)	9,735 (39.4%)	19,391 (50%)	23,619 (58.7%)
In-depth reference	871 (3.7%)	472 (2.5%)	229 (1%)	851 (2.5%)	887 (3.6%)	933 (2.4%)	453 (1.1%)
Consultation/demo	2,486 (10.4%)	3,289 (17.8%)	2,815 (12%)	2,960 (8.8%)	991 (4%)	300 (.8%)	0 (0%)
Other	84 (.4%)	0 (0%)	2,566 (10.9%)	4,192 (12.5%)	3,717 (15%)	9,264 (23.9%)	5,267 (13.1%)
Mediated	2,157 (9%)	1,104 (6%)	871 (3.7%)	632 (1.9%)	395 (1.6%)	298 (.8%)	855 (2.1%)
Total	23,848	18,525	23,459	33,572	24,703	38,747	40,251
Gate count	—	—	252,830	513,947	364,201	350,792	365,370
Formal instruction							
Seminars	—	—	—	1,284	177	867	400
Curriculum BI	—	—	—	—	844	1,175	1,217
Total	—	—	—	1,284	1,021	2,042	1,617

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Appendix 1 Extended

1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05
1,502	1,482	607	500	1,113	722	557	1,574
5,288	6,024	4,606	4,184	2,176	4,477	3,953	5,027
1,119	2,919	1,595	2,114	2,560	1,650	1,621	1,665
72	199	224	303	120	126	46	209
7,633	3,758	1,596	1,603	729	1,093	1,074	1,538
154	87	52	69	25	4	18	18
0	0	0	190	424	508	636	581
15,768	14,469	8,680	8,963	7,147	8,580	7,905	10,031
10,537	5,216	6,313	4,993	3,739	3,188	2,015	N/A
19,705	20,300	13,479	10,763	7,830	6,754	3,209	N/A
2,027	4,409	3,260	3,500	3,158	2,843	1,852	N/A
32,269	29,925	23,052	19,256	14,727	12,785	7,076	N/A
12,039 (25.1%)	6,698 (15.1%)	6,920 (21.8%)	5,493 (19.6%)	4,852 (22.6%)	3,910 (18.7%)	2,572 (17.9%)	1,574 (15.7%)
24,993 (52%)	26,324 (59.3%)	18,085 (57%)	14,947 (53.3%)	10,006 (46.6%)	11,231 (53.8%)	7,162 (49.9%)	5,027 (50.1%)
1,119 (2.3%)	2,919 (6.6%)	1,595 (5%)	2,114 (7.5%)	2,560 (11.9%)	1,650 (7.9%)	1,621 (11.3%)	1,665 (16.5%)
72 (0.1%)	199 (0.4%)	224 (.71%)	303 (1.1%)	120 (.6%)	126 (.6%)	46 (.3%)	209 (2.1%)
9,660 (20.1%)	8,167 (18.4%)	4,856 (15.3%)	5,103 (18.2%)	3,887 (18.1%)	3,936 (18.9%)	2,926 (20.4%)	1,538 (15.3%)
154 (0.3%)	87 (0.2%)	52 (0.2%)	69 (0.2%)	25 (0.1%)	4 (0%)	18 (0.1%)	18 (0.2%)
48,037	44,394	31,732	28,219	21,874	21,365	14,981	10,031
653,940	619,307	257,261	206,922	197,226	170,226	148,687	146,014
168	668	388	381	77	328	419	508
1,161	1,415	1,884	1,624	1,237	1,188	1,335	1,389
1,329	2,083	2,272	2,005	1,314	1,516	1,754	1,897

Appendix 2
Summary of literature examining questions asked at the health sciences reference desk

Authors	Year data collected	Number of questions	Coding results											
			Directional 28%	Reference 72%	Manual subject searches 10%	Publication data 27%	Computer subject searches 8%	General reference 6%	Biographical/Directory 5%	Instruction in library 5%	Citation verification 2%	Bibliographies compiled 1%	Citation verifications	
Calabretta and Ross, 1984	1982/83	1619	Directional 28%	Reference 72%	Manual subject searches 10%	Publication data 27%	Computer subject searches 8%	General reference 6%	Biographical/Directory 5%	Instruction in library 5%	Citation verification 2%	Bibliographies compiled 1%	Citation verifications	
Landwirth, Wilson, Dorsch, 1988	1986/87, over 5 sample months	2427	Directional 35%	Publication data 27%	Manual subject searches 10%	Computer subject searches 8%	General reference 6%	Biographical/Directory 5%	Instruction in library 5%	Citation verification 2%	Bibliographies compiled 1%	Citation verifications		
			Manual quick reference		Manual in-depth reference								Mediated searches	
Salisbury et al., 1990	1982–1987*	21829	66%		2.5%								17.5%	14%
	1987/88**	23736	74%		3%								13%	10%
Sullivan et al., 1994	1991	3502	Location (directional) 33%		Citation verification 27%		Computer (OPAC, MEDLINE, Internet) 18%		Research 13%				Quick facts 9%	
Warner, 2001	1999/00	14080	Non-resource based 46%		Skill-based 40%				Strategy-based 12%				Consultation 2%	
De Groote et al. Current study: Qualitative results	2003/04	1156	Articles on topic X 5%	Finding info on X 3.3%	Research consultation 2.2%	Database mechanics 4.1%	Accessing e-resources 1.2%	Accessing e-journals 2.5%	Book holdings 11.9%	Journal holdings 18.7%	AV holdings 1%	Factual 1.5%		
			Statistical .3%	Technical/Access 4.8%	OPAC .8%	Policies/Services 6.6%	Citation verification .5%	Complaints 1.1%	Office supplies 22.5%					
			Directional	Ready reference	In-depth reference	Consultation/Demo	Other	Mediated						
De Groote et al.	1992/93	23459	24.9%	47.5%	1%				12%	10.9%			3.7%	
Current study:	1995/96	38747	22.1%	50%	2.4%			.8%	23.9%				.8%	
Quantitative results	1998/99	44394	15.1%	59.3%	6.6%		.4%	18.4%					.2%	
	2001/02	21874	22.6%	46.6%	11.9%		.6%	18.1%					.1%	
	2004/05	10031	15.7%	50.1%	16.5%		2.1%	15.3%					.2%	

* Before the introduction of BACS/MEDLINE end user search system.

** After the introduction of BACS/MEDLINE end user search system.