

AN EVALUATION OF THE REQUIREMENTS OF
USERS OF BIOMEDICAL INFORMATION SERVICES
AS PROVIDED BY THE
SOUTH AFRICAN MEDICAL RESEARCH COUNCIL

SUBMITTED IN FULFILMENT OF THE REQUIREMENTS
FOR THE DEGREE OF

MASTER OF ARTS (LIBRARIANSHIP)

AT THE

UNIVERSITY OF CAPE TOWN

UNDER THE SUPERVISION OF

MRS J.G. SMITH

CAPE TOWN

1984

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SUMMARY

The Institute for Medical Literature (IML) provides an online bibliographic service to the biomedical community in South Africa.

The requirements of the users of the services of IML were evaluated in respect of needs and satisfaction of these needs. A non-user population was also identified and evaluated.

The research study was undertaken by

- (a) conducting a review of the literature; and
- (b) conducting an empirical study of users and non-users of IML to construct both a "personal" and "information behaviour" profile of both the user and non-user groups.

The literature was studied to provide (i) a conceptual framework for the field of research, (ii) a compilation of findings in studies related to this study and (iii) a basis for the selection of the methodology employed in the study.

The "personal" profile comprised details of age, rank and work activity type and the "information behaviour" profile comprised details of use of information channels. The needs of the users, as measured by various criteria for satisfaction of these needs, were also measured. The reasons for the non-use of the service were also investigated.

The principal conclusions reached were:

- (a) The expressed information need of the users of IML were satisfied;
- (b) the majority of non-users had not heard of IML;
- (c) there was a difference between the information seeking behaviour of users and non-users of IML; and
- (d) age, rank and work activity type influenced the use or non-use of IML.

PREFACE

The masculine form of personal pronoun has been used throughout the text in accordance with general convention. In certain chapters it has been necessary to use forward references in the text to avoid duplication.

The term scientist is used in the text to mean an individual engaged in the pursuit of science which is defined as "systematic and formulated knowledge" by the Oxford Dictionary.

The researcher wishes to acknowledge the support of the South African Medical Research Council in this study and in particular the staff of the Institute for Medical Literature and the Institute for Biostatistics for their cooperation and help. His special thanks go to his supervisor Mrs J G Smith of the Department of Librarianship for her unflagging guidance and encouragement. His thanks also go to his wife and family for their tolerance and encouragement.



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CHAPTER 1

HISTORICAL ASPECTS

In order to provide a historical perspective for this research project a brief generalised outline of the development of computer-based information handling will be presented in this chapter. The provision of information to the biomedical community in South Africa will be covered in greater detail, albeit still succinctly, as background to the problem area under discussion (cf Ch. 2). Thus the evolution and growth of computer-based bibliographic data bases and their employment in information retrieval systems for the benefit of various user communities will be outlined in the chapter.

1.1 Historical Aspects - General

A database generally speaking is a collection of information but the word has now come to be used in a narrower sense to describe a collection of information stored on magnetic tape or disks for computer manipulation (KATZ, 1978:129). Although the data stored in this fashion may be of any description, the databases of concern to this study are those which contain bibliographic information.

Lancaster (1979:11-12) has defined information retrieval as the process of searching some collection of documents, referred to in the widest sense, in order to identify those documents which deal with a particular subject.

to speed up the production of Index Medicus, a monthly compilation of biomedical information citations. This system used machine readable tapes which were able to communicate directly with a typesetting computer, thus eliminating the human element in part of the printing process. It was soon realised that this data in machine readable format could also be manipulated by the computer to generate bibliographies on specific topics to satisfy specific user needs. Thus in 1963 these tapes were used by NLM to launch its MEDLARS⁽¹⁾ system (LANCASTER & OWEN, 1976:4).

These early systems of the 1960's, of which MEDLARS is one example, were operated, as mentioned before, in an offline mode employing batch processing techniques. The information was stored on magnetic tapes and these were accessed in serial fashion (LANCASTER & OWEN, 1976:5). One of the limitations of such a system is the lack of a browsing facility or interactive dialogue between the searcher and the system. The search formulation is dealt with as a complete package and once entered into the system cannot be altered during the processing, nor can the results be studied until the search is finished. This affects the precision and effectiveness of the search in that flaws in the logic of the questions posed can be corrected only after studying the results and by re-entering the entire search. Such procedures are time-consuming to say the least (CUADRA, 1978:7; LANCASTER & OWEN, 1976:14).

In 1964 Boroko, working at the Systems Development Corporation (SDC) was conducting research into the concept of online information retrieval. His

(1) The Medical Literature Analysis and Retrieval System of NLM is commonly referred to as MEDLARS.

system known as Bibliographic Online Display (BOLD) was designed to permit the user to put questions to the database by means of a terminal and obtain results on the screen of the terminal. An important step was the option offered to the user to modify the search in view of the results displayed i.e. an interactive online process (BECKER, 1974:9). Kessler was also conducting similar research and in 1962 developed an interactive system known as the Technical Information Project (TIP) (LANCASTER & OWEN, 1976:15). In both the TIP and BOLD systems the user's terminal was connected to the computer by a dedicated cable, thus placing a physical restriction upon utilisation by users who were remote from the computer (BECKER, 1974:9). The use of commercial telephone lines to provide the link between a user and the computer was demonstrated as early as 1964 at the New York World's Fair. A small bibliographic database was mounted which could be accessed by searchers on teletype machines via ordinary telephone lines from remote locations. The important point of this demonstration and a significant advance in the state of the art, was the ability of several searchers to interrogate the computer simultaneously from different locations (BECKER, 1974:10).

The information processing programs developed by researchers at SDC and similar organisations were refined between 1966 and the early 1970's until the stage was reached in the early 1970's where large online systems were made available to the public. One of the first was the MEDLARS system of NLM which became fully operational in 1972 as an online system (ROSSOUW, 1977:109). Thus the stage had been reached where a convergence of computer technology and communication system development enabled an information centre, remote from the location of the database, to access and interrogate it for the benefit of the users of the centre (LANCASTER & OWEN, 1976:17).

This combination of machine readable databases which could be accessed by telephone, coupled with developments in the telecommunications industry, provided the impetus for the tremendous development in online searching that has taken place since the early 1970's (WANGER et al, 1976:1).

The development of the online industry, when viewed from the aspect of the number of databases and references available therein, shows the mushrooming expansion of the industry since its inception. In 1975 Williams calculated that there were 301 bibliographic data bases available on a world wide basis and by 1979 she stated the number had grown to 528 (WILLIAMS, 1980:28). By 1983 Cuadra Associates (1983:7) had listed 1 488 databases available internationally to the public, although not all were bibliographic in nature. Hall and Brown (1981:vii) believe that in 1972 there were only approximately 3 million bibliographic references contained in the existing databases whereas by 1980 there were 65 million, with unique additions being made at the rate of 6 million per year.

1.2 Historical Aspects - South Africa

In this section the developments in the field of computerised information retrieval systems with special reference to the biomedical field within a South African context will be discussed. The researcher is aware that concomitant with such developments in the biomedical field, progress was being made with similar systems in other areas by organisations such as the Council for Scientific and Industrial Research and the Nuclear Development Corporation of South Africa. These developments, however, will not be discussed as they are not relevant to this study.

1.2.1 The South African Medical Research Council

The South African Medical Research Council (MRC) was established by an Act of Parliament in 1969 and Prof A J Brink was appointed the first President on 27th August 1969. This Act was 'to provide for the promotion of research in the field of the medical sciences, for that purpose to establish a South African Medical Research Council, and to provide for matters incidental thereto' (MRC GUIDE, 1974:2).

The objectives of the MRC as laid down in the Act included inter alia the following:

'To gather and collate scientific and technical information relating to the medical and related sciences, both in the Republic and abroad and in co-operation with governmental and other agencies, and to render such information available to such persons as it may deem fit' (South African Medical Research Council Act, No 19, 1969).

The MRC has two main ways in which it supports research. It can subvent research at other organisations such as universities or it can employ its own staff in MRC Institutes. Whilst the MRC has a policy of decentralization it has established its own service facilities to assist researchers in certain aspects (MRC GUIDE, 1974:8-9).

The MRC conducted a feasibility study in 1975, of the various options possible to determine how best to fulfill its objectives with respect to the provision of biomedical information services. As a result of this study the MRC decided to create the Institute for Medical Literature (IML) which became operational in 1976. This institute was designed to provide a national information service to the biomedical community (ROSSOUW, 1979:3).

The President of the MRC evaluated the experiences of overseas medical organisations with online information retrieval systems and as a result of his report the Council of the MRC decided to use the MEDLARS system to provide bibliographic services through IML. A formal agreement between NLM and the MRC was signed on 21st May 1976 which allowed the MRC to access the MEDLARS system for this purpose (ROSSOUW, 1979: 77). The technical arrangements to establish a telecommunications link-up between South Africa and the NLM computer in Bethesda, Maryland, U S A were completed in early 1976. As a result online services were offered to users in South Africa as from 1976 (ROSSOUW, 1977: 111). The service was at first only available from IML in Cape Town but has since expanded as computer terminals have been installed at the University of the Witwatersrand in 1977, the University of the Orange Free State in 1979 and the University of Pretoria in 1982. Although these organisations directly access the MEDLARS database at NLM they operate under the aegis of the MRC - NLM agreement.

Rossouw (1979:127) in outlining the policy of the MRC with regard to the provision of information services, states that 'the medical schools, hospitals and biomedical research institutions were to be regarded as the prime user group' but adds the rider 'with extension of the service to other potential user groups only when the needs of the prime user group have been met to the fullest extent'.

The MRC's estimates, as projected in 1975, of the potential user population who would utilise the services of the IML are shown in Table I (ROSSOUW, 1979: 55).

Table 1. Potential users of MEDLARS service (estimated)

<u>Research Worker</u>	<u>Total Number Potential Users</u>	<u>% Using Service Per Year</u>	<u>Potential Users During Any One Year</u>
Biomedical - Universities	2 461	20	492
Biomedical - Organisations	804	20	160
Biological or Life Sciences	<u>878</u>	15	<u>131</u>
	<u>4 143</u>		<u>783</u>

These figures were employed in the feasibility study to calculate the computer time that would be used each year on the basis that a user would request one search per year. If it is assumed that 783 biomedical research workers were to utilise the services of IML each year then after a five year period almost 3 900 users should have been recorded by IML. A count conducted by the researcher in August 1982 showed that in this period only 1 400 users had used the services of IML. In fairness it should be pointed out that the above figures from the feasibility study are subject to all the dangers of estimates, especially those made for a venture that was very new in South Africa at the time of the study. Nevertheless it appears that a considerable proportion of the potential user population has not yet used the services of IML.

1.2.2 Present Retrospective Search Services Offered by IML

The equipment at IML is similar to that used by most organisations which access computerised databases regardless of geographic location. The high quality of telephone line transmission of voice or electronic data render it

possible to access computers in the U S A, Italy, Germany or Switzerland as easily as though they were located in South Africa. Most databases are available during the normal working hours of IML for most of the day.

The first attempt at accessing the MEDLARS database of NLM was made in 1976 and this was routed through Paris (ROSSOUW, 1977:111). Since then experience has shown that it is easier to access computerised databases in America via a data transmission network called TYMNET which has an access point in Cuppertino, California (MILLIGAN, 1982:80). The time taken to connect up by telephone and the response time of the system is the same in South Africa as it would be if the entry was done at NLM itself (Personal observation).

The location of IML vis-à-vis that of the user communities in Durban, other centres and even in Cape Town is such that a high proportion of IML users cannot be present when their search is being conducted. As a result of this most of the search requests arrive at IML by post. IML has designed a form for use by the user when submitting a request for a search. The purpose of this form is to obtain as much information as possible upon which to base the online search strategy for the user. Supplies of the form are held by all medical libraries and a replacement form is sent to each user with the results of each completed search. A copy of this form is shown in Appendix B.

In completing the form the user is encouraged to state the problem in a narrative style and also to supply any keywords that could be used in the search. Provision is made on the form for the quoting of relevant references as examples of the type to be sought in the search. The price list for the databases commonly used by IML is included on the form to provide an indication to the potential user of how much the search could cost.

IML makes every effort to conduct the search on the day the request for information is received in the institute. This minimises the time delay between the execution of the search and receipt of the bibliography by the user.

Where there is a problem in understanding the requirements of the user, every effort is made to contact the person involved by telephone to obtain clarity to execute the search. A similar approach is used if it is felt that the preliminary results of the initial online search require evaluation to confirm that they are what is required.

The results of the search are received in the form of a bibliography which is printed by the computer at NLM. This is sent to the requester together with a simple evaluation card designed to provide IML with information on the user's evaluation of the search. A stamped addressed envelope is also provided so that the user can easily return the evaluation card. If the card is returned, and the evaluation appears to be unsatisfactory from the user's point of view, then the user is contacted to discuss the reasons. If necessary the search is repeated, any new information provided by the user being incorporated in the search. This repeat search is carried out free of charge. If the user fails to return the evaluation card no follow-up effort is made by IML.

CHAPTER 2

STATEMENT OF THE PROBLEM, HYPOTHESES AND PROPOSED METHODOLOGY

2.1 The Problem and Its Setting

The traditional manual methods of assembling bibliographic reference lists for research workers by librarians or information services' ^{users} have been complemented by the development of machine readable data bases and computerised retrieval methods during the 1970's. Advances in electronic technology have brought systems using such data bases to the point where it is now possible to search for data on specific topics amongst millions of references and obtain material relevant to the topic within seconds, even though the distance separating the user and the information is across half the planet (CUADRA, 1978:7).

As was mentioned in the previous chapter the South African Medical Research Council took the lead in making these services available to the biomedical research community in South Africa through IML. Since the inception of the service in 1976 the records of IML show that over 3 500 bibliographies have been compiled for some 1 400 users by IML.

Before starting this service the MRC carried out a feasibility study to determine the potential demand for computerised information services and this study estimated that the potential annual user figure was 783 (cf 1.2.1). The records of IML show, however, that the annual number of users as of July 1982 does not correspond with the estimate in the feasibility study. There may be

several reasons for this discrepancy, such reasons may concern the basis of the feasibility study itself, or the service provided by IML itself or personal factors concerning research workers. This situation where the service is considered to be under-used is not unique, however, to South Africa as Bellardo in reviewing scientific research in online retrieval said that online searching has not been as well received as it was originally envisaged (BELLARDO, 1980:210).

In the first series of reasons which relate to the background of and the basis for the feasibility study the timing of the study is important. The study was undertaken at an early stage in the development of computerised information retrieval systems (cf 1.1) even in the American context and in the South African context the stage was literally embryonic. The concepts, therefore, were so novel for South Africa that the figures in the feasibility study could only be regarded as working guidelines. In compiling the figures staff lists and organisational membership lists were used to obtain global figures from which annual totals of potential users were derived. No classification of individuals on the lists as to their potential use of computerised information services was made. A classification into age, rank or type of work activity, if it could have been achieved, would probably have resulted in a different figure as these factors could have an influence on information seeking behaviour. The purpose of this line of reasoning is not to find fault with the feasibility study but merely, with the wisdom of hindsight, to offer possible explanations for the apparent discrepancy between the estimated figure and the figures of actual use.

One may also consider the possible reasons for the discrepancy which concern the service provided by IML itself. This service, as previously stated was

launched in 1976 and was extremely novel in concept. Information services in South Africa have traditionally been provided by libraries and have been available free of charge to the user. A research worker who has a developed pattern of information seeking behaviour for work purposes can reasonably be expected to have no strong desire to change, especially if the results have proved satisfactory in the past. Furthermore, the fact that a nominal fee is charged for results produced by a new method, which were previously obtained free of charge, may influence the attitude of the potential user.

In considering the user population, potential users may fail to utilise the services of IML because firstly they may perhaps be unaware of them or be unsure as to how these services can help them in their quest for information. Secondly they may know of the services available but have had no need for them as yet and thirdly there may be some potential users who have been discouraged from using the services available due to unsatisfactory results obtained by colleagues from the service.

Further questions may be posed regarding those members of the biomedical population who have used the system to date. These users may, or may not, have been satisfied with the service provided and it can be reasonably assumed that those who are satisfied will re-use the service if they need to do so. Those who are not satisfied may, however, have one or more reasons for their non-satisfaction. Firstly it may be that the results of the search did not fulfill their expectations as to the provision of suitable references, secondly this could be due to the handling of their search request by IML, who may not have interpreted it correctly. A reason for this may be the physical distances which generally separates users from IML and thus make it difficult for the user to be present when their search is being conducted at IML. Where

the user is not present during the search no guidance can be obtained as to the quality of the results during the interactive search process. Thirdly the distance between the user and IML could cause unacceptable time delays between the user requesting a search from IML and receiving the results.

To date, however, there has been no indication that users have not re-used the services of IML for such reasons and it may be that most of the users have their information needs satisfied by IML.

2.2 Hypotheses

The need for research to determine the satisfaction of users of services such as offered by IML (cf 1.2) in the South African context and the underlying reasons for non-use of the services, is evident from the points raised in Section 2.1. The researcher thus proposes to base such research upon the following hypotheses:

- a) The reason for non-use of the services of IML is either non-awareness of the services offered or the non-user having no need for them at present;
and
- b) Those who use the services of IML have their information needs met in that their expressed needs are satisfied.
- c) There is little difference in information seeking behaviour between users and non-users of the services of IML;

- d) The use of the services of IML is influenced by age, rank or work activity type;

These hypotheses will be tested in three ways:

Firstly by undertaking a survey of relevant literature to determine whether substantial results relevant to the hypotheses already exist (cf 3.2); and

Secondly by conducting an extensive empirical study in both user communities; viz.

- i) users of the services of IML;
- ii) those members of a relevant community - the Medical School of the University of Cape Town who have not used the services of IML; and

Thirdly by comparing the analysis of the data derived from the empirical study with similar studies revealed by the literature survey and presenting conclusions drawn from this comparison.

The user community in (i) above will consist of all IML users over the time period chosen (cf 5.1.1). In the case of the study in (ii) it was decided to sample the population of the Medical School at UCT because firstly the extent of the non-user community in South Africa is not known and therefore it is not possible to select a representative sample; and secondly the community at UCT would be reasonably representative of other medical schools as to rank strata, work type and the close juxtaposition of users and non-users.

CHAPTER 3

A SURVEY OF THE LITERATURE PERTAINING TO USER STUDIES WITH REFERENCE TO THE
USE OF INFORMATION SYSTEMS

3.1 Introduction

In this chapter the literature relevant to this study will be reviewed. The review will deal only with those areas which are of relevance to the aspects of the study to be undertaken.

The objective in conducting such a review is firstly to explore the theoretical background and to provide a reference framework for a study and secondly to provide a means of comparing the findings contained in the literature with those reported in this study.

3.2 The Literature Survey

The literature survey was undertaken in two sections. A manual search of the literature sources was conducted and a search of the computerised databases, which were considered to cover the subject of the study, was undertaken. Three aspects were searched for, firstly information on online information services; secondly user studies relevant to the field of study; and thirdly research methodologies employed in use and user research (cf chapter 4).

The manual search was conducted by consulting the bibliographies prepared jointly by the British Library Reference Division and the Library Association Library, and which are contained in the monthly publication CABLIS (Current Awareness Bulletin for Librarians and Information Scientists); the annual bibliography of articles dealing with all aspects of computerised databases prepared by ONLINE REVIEW and covering the period from 1965 to the present; and the bibliographies on library science contained in INFORMATION REPORTS AND BIBLIOGRAPHIES prepared by Science Associates of New York.

The computerised databases ERIC (Educational Resources Information Centre), LISA (Library and Information Science Abstracts), Science Citation Index, and Information Science Abstracts were also employed to prepare bibliographies of references, the search profiles being prepared and the searches executed by the researcher on the DIALOG system of Dialog Information Services. The monthly updates of the MEDLARS database of the National Library of Medicine, Washington D C and the Science Citation Index were also scanned for material over the period of the study.

These two approaches identified much material as being of possible use and only that which was considered relevant was studied. Literature in languages other than English was studied where abstracts in English were provided, however the material relevant to the study was predominantly in English and mostly reported in American journals. The facilities of the Libraries of the University of Cape Town and the University of Stellenbosch were used to obtain material found in the bibliographies produced by the above searches.

3.3 Conceptualization of the User Community of Information Services

In this section a review of the literature with special reference to users of computerised databases and information services will be presented.

The user community is a term used to describe the population who may use a service and Gardiner (1980:4) makes this distinction when he referred to the 'public' as the user community. He postulated that within this community the confirmed users of library services should amount to 7% of the total group, the uncommitted group should represent 48% of the public and the 'hard core' non-users would represent the remaining 45% of the total.

Wersig (1973:12) considers there are four categories of users which can be identified when discussing information services. The first is the potential user, a group of people who could be interested in the service; the second is the expected user, who has access to the service; the third the actual user, who has used the service; and finally the beneficiary who has derived a benefit from the service. Wersig goes on to suggest that these categories correspond to a set of information needs rather than a class of people.

Hensley (1979:2) offers a similar definition of these groups in the community. She defines a user as someone who uses the service or its information; a potential user as one to whom the service or its information is directed, in other words the target population; and a non user as someone who does not use the information or service on offer because of lack of awareness or motivation.

The annual potential user population of IML was estimated by Rossouw and has been dealt with earlier in this study (cf 1.2.1) and the actual users of IML can be identified from the records of IML. Therefore, for the purposes of this study the researcher shall consider a user to be someone who has used the services of IML to conduct a literature search on a computerised data base and a non user to be a potential user who had not, at the time of the study, used the services of IML. Thus, the sections of the user community which will be investigated, are the users and non-users of the services of IML and in the study the information seeking behaviour of both groups will be investigated.

User studies are considered by Menzel (1966:43) to constitute investigations of the user and their utilisation of channels of information communication in relation to their need. Wersig (1973:13), in turn, makes a distinction between studies on information seeking behaviour as user studies and studies on the utilisation of channels of communication which are closer in definition to use studies. Kunz et al (1976:16-7) distinguish between user and use studies and in their review provide the following different approaches to such studies, viz:

User studies consisting of

- a) Preference and evaluation studies, where individual preferences and evaluations are examined with regard to different information channels, media and facilities.
- b) Special comparisons of channel ratings where the preferences of individuals for specific information channels is studied.
- c) Demand studies where the expressed information needs of user groups are studied.

Use studies consisting of

- a) Channel studies which relate to the frequency of use of channels.
- b) Information behaviour studies which do not concentrate on a particular channel but characterise information habits and behaviour no matter what channels are used.

Kunz goes on to say that in a narrower sense use and user studies often focus on different ways of behaviour of special user groups resulting in pattern and behaviour modes of users being identified.

For the purpose of this study user studies will be employed as a generic term to cover both channel utilisation and information behaviour studies. This will allow an information behaviour profile to be constructed for both the user and non-user groups.

A recent bibliometric analysis of library studies by Peritz and the 'Information needs and uses' reviews in the Annual Review of Information Science and Technology indicate that although many user and use studies have been conducted over the period since 1950 very few could be located where the non-use or non-user had specifically been identified and studied (PERITZ, 1980:265, CRAWFORD, 1978:16). A possible explanation being that the user is easy to identify and list and thus easily studied. The non-users, conversely, are not easily identified and thus, for this reason, are more likely to be avoided as a subject of study. This problem of population identification may result in only the actual user group being studied. Such studies, however, may only confirm facts which are already known and in applying the results so obtained, any adjustments made may be only for the benefit of those who already use the service. The requirements of the non-user may therefore be ignored (LANCASTER, 1978a:32; ROWLEY & TURNER, 1978:119).

It is possible, however, that this danger may be more apparent than real, as is indicated in a recent study of research conducted on the online retrieval of information. Several of the studies had shown that there was little difference in the information seeking behaviour between the users and non-users of online services (BELLARDO, 1981:210). Similar findings are reported by Curtis (1977:281), Stern (1976:92) and Bayer and Jahoda (1979:97-9) who suggest that there are negligible differences in the information seeking behaviour between users and non-users of online services. With particular reference to the non-users, Curtis claims that their non-use of the service could not be attributed to such causal variables, as a) their knowledge that online searching was possible, b) the availability of search services, c) area of research and d) age factors. He therefore concluded that there was little or no correlation between these variables and non-use of the service.

However, in a report on the characteristics of non-users and users in which the population studied was the student body of a college, it was found that the non-users had a lower awareness of library services and resources than did the users. It was also demonstrated that the non-user had a lower level of skills in utilising the resources and facilities of the libraries (MUSAVI, 1977:137-8). Bellardo (1981:210) in a review of scientific research studies on online retrieval concludes that future research should concentrate on non-users and disgruntled users and less on 'satisfied' users. This view supports that expressed by Lancaster (1978a:32) and that of Gardiner, reported earlier who posits that if only the user community is polled, the views of less than 10% of the potential users are being considered (GARDINER, 1980:4).

In conclusion it could be reiterated that this problem of identifying the non-user has probably been one of the major reasons for the paucity of studies on this subset of the population. King & Bryant (1971:242), although generally agreeing that the non-user is difficult to identify, suggest that the non-user could possibly be identified by sampling a potential population for users and non-users, thereby ensuring that the opinions of both categories are polled.

3.4 Evaluation of user needs and satisfaction

3.4.1 Concept of evaluation

Busha & Harter (1980:160-1) consider that evaluation research in library and information science is that type of research which is undertaken to obtain objective and systematic evidence of the success or failure of library and information systems' projects or programmes and involves the measuring of the effectiveness of standards or goals achieved in terms of set objectives. Boon (1982:19) uses the term criteria for the things to be measured and considers that in assessing the effectiveness of the criteria being fulfilled such measurement could be achieved either quantitatively or qualitatively. This viewpoint is also advocated by Swanson (1975:57) who defines criteria as indicators of performance and states that they provide the means of determining the degree of accomplishment of the objectives. She points out, as Boon did, that criteria are not measures in themselves but that units of measurement can be applied to them. A study of the relationship of the units of measurement of the different criteria may yield useful information pertaining to the phenomena being discussed. Swanson goes on to say that in

evaluation studies, information scientists should be curious about how and why people acquire information and the impact their success or failure in doing so has upon their behaviour. From the foregoing it would be reasonable to consider evaluation, as applied to information services, to relate to the assessment of the criteria laid down by the service. Such assessment would be achieved by measuring the variables which apply to the criteria.

The process of conducting searches for users by means of a computerised data base in bibliographic information services may be considered to have four main components which interact with each other in a dynamic fashion. The four components are the user, the information service, the data base and the computer system. Whilst these components are all linked and interacting it is, nevertheless, possible to examine each component independently without examining the whole system. In other words the computer system itself can be investigated without reference to the user and vice versa. The early research on the MEDLINE data base is an example of this and here the capabilities of the data base itself were investigated rather than the satisfaction of the user (LANCASTER, 1968: 2-5). Cleverdon (1974:173) conducted research to determine the effects of using different indexing languages without any reference to the user as an integral part of the evaluation. In assessing the effectiveness of a system or an information service from the viewpoint of its users the criteria to be used should relate to the users as it is their judgement of the effectiveness of the system or service according to the results produced which will provide the means of measurement of the criteria (BOON, 1982:9). From consideration of the foregoing it would be essential to take into account the views of the users and non-users of information services when assessing these services.

3.4.2 The concept of user needs

The requirements of the user and non-user of any information resource have been discussed in the literature at length and the variety of definitions and classifications of the broad term 'needs', indicates the difficulty the information profession has in deciding upon a commonly accepted conceptualization.

3.4.2.1 Classification of needs

Menzel proposes a categorisation of needs according to the scope and functional requirement of the user. He distinguishes five types of needs viz. the current awareness need, the reference need i.e. the need to have the latest information on a specific topic, the need for exhaustive coverage of the topic, the need for complete coverage when entering a new field and the need for stimulatory information which can lead to the generation of new ideas (MENZEL, 1964:6-11). Butterly has suggested a classification of needs based upon the class of user. Firstly she suggests that there is a class of users who needs a complete bibliography with which to prepare a report or write a paper, secondly there is a class of users who needs a specific answer to a specific problem and thirdly there is a class of users who needs the information in an evaluated and digested form (BUTTERLY, 1982:1-2). A study by Teitelbaum of online searching and the needs of pathologists and pharmacists produced a pattern of needs which tends to confirm this view. Of the respondents, the majority wanted only a few recent references or general review papers compared with a small minority who required an exhaustive bibliography (TEITELBAUM & SEWELL, 1982:299). The researcher considers the following classification offered by Masson to be a practical classification

suited to the services provided by an information service as it outlines three basic user needs for information. The user may need current information to keep up to date with a topic or, specific information to provide answers to a narrow aspect of a field or, exhaustive information to ensure that all available knowledge is considered in a field (MASSON, 1971:227-8).

3.4.2.2 The definition of needs

The use of the terms 'demands' and 'wants' is suggested to clarify the concept of need. A demand can be defined as that which an individual asks of a library or information resource (FAIBISOFF & ELY, 1976:271; ROWLEY & TURNER, 1978:54), while a want is something that someone would like to have and this may or may not be translated into a demand for it to be satisfied (LINE, 1974:87; ROWLEY & TURNER, 1978:54). Line (1974:87) also introduces a further term, that of 'requirement', which he considers as a umbrella term which could be used to describe what is needed or what is wanted or what is demanded.

In proposing a solution to the semantic confusion surrounding the concept need, Wilson suggests that the phrase 'information seeking towards the satisfaction of needs' could replace the term 'information needs'. Wilson (1981:8) argues that in studying the user and the use of information systems, what is being investigated is really information seeking behaviour. 'Need' is rather why a user decides to seek information (WILSON, 1981:8). This concept is rather similar to that postulated by Gardiner whereby the term 'expressed needs' is used (GARDINER, 1980:12). The investigation of information seeking behaviour should, however, shed some light on the needs of the user because the three-fold classification of the needs of the user as defined should affect the information behaviour of the user (SMITH, 1981:81). Smith lists

the sources through which needs can be met and notes that they will vary according to the need type.

3.4.2.3 The measurement of need

Line (1973:38) points out that the potential demand of a user is very difficult to measure as the very fact of being 'measured' may influence the response in a survey. The measurement of the actual demand made by the user may result in misleading data as the user may tailor a demand to take account of expectations held of the service. An empirical study of expressed demand, however, could be helpful because, if these demands should be satisfied then a rise in the level of user expectation should occur. If this process is repeated then the process of raising demand and expectation in tandem should result in an improved service. This is contrary to the views expressed by some authorities regarding the advisability of concentrating on the satisfaction of the actual user and using the feedback from this segment to improve services. It is considered that the danger inherent in this approach is that the demands of the non-users will be ignored (LANCASTER, 1978a:32; GARDINER, 1980:5).

Tagliacozza (1977:243) suggests that it may not be possible to identify the real needs of the user and as the expressed needs of the user may be the closest we can get to the real needs we should accept these as a measure. The only outward expression of the needs or requirements of a user may be that which is asked of the information service and it may be possible to determine whether the demand has been satisfied by investigating the use made of the responses provided by the information service. The measurement of the change produced in some form has been considered as a measure of satisfaction of the

need, but here again sophisticated users might well use the information either to confirm their results or to refine existing findings. Thus change would be difficult to assess and may be a misleading measure (HENSLEY, 1979:2).

3.4.2.4 The variables influencing measurement

The needs of a user may vary with the stage of the investigations being carried out and with the discipline involved. There is a considerable difference in the information required by those still forming their research ideas and those who have reached the methodological stage for the study (MARSHALL, 1975:504). Furthermore, the requirements of a general practitioner will differ markedly from those of a medical research worker and within the latter category a variation in expressed needs, and thus information seeking behaviour, can be displayed by those undertaking applied or clinical research and those conducting pure or basic research (HENSLEY, 1979:19). In a study of information needs of general practitioners Lor developed a model to demonstrate the information need/use cycle and argued that the information needs are largely determined by the nature of the problem solving process including the type of problem to be solved. Several sources were quoted to support this view (LOR, 1979:14).

Allen (1981:5) in discussing information flow in technology and science explains that the needs of scientists and technologists differ from each other because the output of workers in each of these areas is in a different form. Scientists use information to produce a paper, thus generating more information, whereas technologists transform information into a process or a product and by virtue of this difference in form of output there will be a difference in the input requirements of both from the information system.

Allen suggests that a technologist is more likely to obtain information by means of personal contact and will look for the assistance of colleagues in interpreting documents for his own purposes. The scientist on the other hand will look to the written word for material upon which to base his work and the results of his work will also be in the written form. If one extrapolates this concept to the world of medical science and considers the medical researcher as a scientist and the general practitioner as one whose task is to transform knowledge into practice, then the principles that Allen has described should apply. Thus the general practitioner or doctors who spend most of their time on patient care could be expected to have less need for scientific papers and a greater need for evaluated information. This view is supported by an investigation into the information needs of general practitioners which revealed that their information requirements were for evaluated information rather than for information presented as a scientific paper (LOR, 1979:56).

In conclusion, it can be reiterated that due to the number of definitions of needs which have been postulated, it may be more appropriate to approach the problem from another viewpoint and not measure needs as such, but measure the responses of users as to whether their expressed needs have been satisfied. The user is the best judge as to whether a document is relevant to a need or not (CLEVERDON, 1974:174) and thus the satisfaction of the expressed need is best judged by the user. This, of course, is contrary to the views expressed by Lancaster, Gardiner and others earlier in this section but if the only measures of real needs are the expressed needs and the non-users do not express needs then it is not very practical to do other than take heed of views of the users.

In considering the results of the studies reviewed in the literature the researcher has noted the lack of concensus on the definitions of need in relation to users of information services, and also the possibility that the need expressed by the user may represent either all or only part of the true need. The researcher therefore suggests that it would be reasonable to rather measure the satisfaction of the user's need by inference rather than by direct means in any study in which the needs of the user and non-user are investigated.

3.4.3 The satisfaction of the user

One way of finding out if the information service has fulfilled the need of the user is to evaluate the satisfaction of the user with the service (BOON, 1982:59). Cooper (1973:88) maintains that if a subjective expression of satisfaction by the user can be quantified, then this could be an ideal measure of the service. Cooper suggests monetary quantification or a similar quantifiable measure for this purpose. However such a quantitative evaluation would require the placing of a monetary value on each document or reference retrieved by the search in order to calculate a total value. The feasibility of the practical execution of Cooper's suggestion could be queried and Soergel (1976:275) in a discussion of the arguments put forward by Cooper rejects them. He suggests that a better measure of the fulfillment of the user's needs would be the measurement of the improvement in task performance by the user in response to the output received from an information service. As was discussed earlier (cf 3.4.2) there is considerable variation in the use to which users put information and any measurement of change in task performance must take these into account. The range involved may make this task impossible to measure with any reliability.

non-relevant documents. Boon (1982;24-5) points out, however, that the precision ratio criteria gives no indication of the actual number of documents involved and thus a ratio of 20% may mean 5 out of 25 or 125 out of 625 references. Other considerations may then be introduced in the user's value judgement of satisfaction, depending on the number of references involved.

The feasibility of measuring the recall factor when conducting a delegated search on a large data base, such as the MEDLINE data base⁽¹⁾, can be queried. The precision ratio appears therefore to be a more practical measurement as the user can provide a unique evaluation of the output from each search.

With the developments in online searching in the late 1970's the criterion of user satisfaction was incorporated into user studies as a measure of the user satisfaction in its own right and not merely as a measure of system performance. This approach emphasized the problem of how to assess satisfaction. One positive measure of satisfaction is the re-use of the system by users. Data on this aspect can be collected from the records of an information resource and, as the subject is not being observed in the collection of the data, any bias due to this factor can be discounted. This method was explored in a study conducted by Rubenstein and Schultz over three years and a prediction model of re-use, using measurement periods of three months, was constructed (RUBENSTEIN & SCHULTZ, 1968:320). The researcher would like to suggest that to measure satisfaction by this method alone would be incorrect, as it takes account of neither the changing needs of the user

(1) The MEDLINE data base contained 3 981 447 citations on 1 February 1983 according to the NLM Technical Bulletin for that month (NLM:2).

with time (cf. 3.4.2), nor that users may move between organisations and locations resulting in transfer of re-use demands to other information resources, nor that users may have a solitary demand, nor the situation where a user was satisfied but had no further search requirements for some time. An alternative to measuring re-use may be to find out how many users would be inclined to re-use the service for future information needs. This method was followed in a study conducted by Beeler where it was reported that 88% of respondents indicated they would re-use the system in response to the question 'would you use the system again?' (BEELEER, 1981:63).

Cleverdon (1974:179) postulated that user satisfaction could be measured by combining two measures. The first was derived from a combination of the quantitative measure of the search length or number of references produced and the qualitative measure of satisfaction. The second was the number of relevant references retrieved. This was proposed as a measure of the value of the system to users. The limitations of this technique can arise from the use of 'the number of references retrieved' as a parameter in the measurement. There may be reasons for variation in this parameter which are not connected to the intellectual aspects of the search and thus may lead to a false assumption in the final result. Firstly the user may not expect, or hope for any references, if the topic of the search is new and at the forefront of a research field. Secondly, the references retrieved on any topic can be artificially limited by factors not connected with intellectual aspects of the search. These factors may include the retrospective time span over which the search is conducted, or the restriction of references to certain languages, to mention but two of the possibilities. Thus if the quantitative aspect of the number of references is excluded on this basis, the number of relevant citations should, on similar grounds, also be excluded and we are thus left with the qualitative expression of user satisfaction as a measure.

Tagliacozza considers that the subjective statement of satisfaction by a user can be influenced by factors not related to the search being evaluated. The use of a new technology, the relationship with the information source, the speed of response in comparison with manual searching may all influence the expression of satisfaction. (TAGLIACOZZA, 1977:243).

It would appear from the foregoing, therefore, that the measurement of satisfaction must, inevitably, be subjective as it is a response by the user as to whether or not his needs have been fulfilled. It has already been argued that needs can be defined in several ways (cf 3.4.2) and thus it would appear that satisfaction must also be assessed in a qualitative rather than quantitative manner. In a study of user satisfaction with online searches the view was advanced that satisfaction may be a state of mind which is experienced by the user and therefore probably has both intellectual and emotional content. Thus the level of satisfaction will be determined by what is important to the user and search output may be only one of the factors involved in determining satisfaction (TESSIER et al, 1977:383). However, Tagliacozza considers it is not sufficient to measure only one aspect of satisfaction, and in order to form a judgement, several measurements should be made regarding the search outcome (TAGLIACOZZA, 1977:264). Swanson (1975:76) in reviewing the progress in the measurement of satisfaction has stated that 'Identifying the variables that should compose a measure of patron satisfaction appears to be a stumbling block for researchers'.

Tessier et al (1977:384) in a study of user satisfaction with computerised literature searches, propose several measures that could be examined in the evaluation of user satisfaction. These aspects were firstly, the satisfaction

of the user at the outcome of the search and this is not necessarily related to the recall or precision ratio of the output as users will have individual standards. Secondly the satisfaction of the service provided may be influenced by the view of the user about the information service as a whole. Thirdly the service provided to the user and the manner in which it is operated could influence satisfaction and finally they suggest that user interaction with the staff must surely influence the user. Tessier et al go on to say that the latter measure was not considered at the time but that it should be considered as it is a factor which can be controlled directly by the organisation.

In view of the foregoing the researcher would like to suggest that the precision ratio could be an important measure in assessing satisfaction and that aspects relating to the organisation such as the user interaction with staff and the service provided to the user should provide valid measures upon which a correlation with the level of satisfaction could be established.

3.4.3.1 User satisfaction and organisational factors

3.4.3.1.1 Fees

The user's view of the organisation can be influenced by several factors and a factor which could influence the satisfaction of the user is the payment of a fee for the search. Online searching of computerised data bases introduced a new dimension to the search for and provision of references, because by using computer time and telecommunications, an easily measurable cost dimension was introduced. It became possible to calculate direct charges for these elements used and to apportion them to a specific user. Virtually all information

services which use online data base services charge the user a fee for conducting a search (WERNER, 1979:9). The extent of the fee will vary according to the circumstances, but the idea of charging a fee is novel in traditional reference work and the effect it has on demand has therefore been the subject of some study. The size of the fee or how it is derived is not germane to this study but the effect of a fee or an alteration in fee rates is relevant and these aspects were reviewed in the literature.

There have been reports that the charging of fees has caused no user resistance to the use of online searching in the literature reviewed (BROWN, 1977:156; JOHNS & ROBERTS, 1981:306;). Where subsidized fees were used to launch a new service and were subsequently increased to recover costs, then a temporary reduction in the level of search demand has been recorded but this has generally reverted to the original level in a very short time (CROWTHER, 1981:151). Huston (1979:1812) on the other hand, states that the imposition of fees, i.e. where a charge is levied for a service formerly available free, has lead to a considerable decrease in demand. He, furthermore, quotes instances where the demand was reduced by over 75%. A later study of the influence of fees upon use of an online service concluded that where the fees were charged from the inception of the service they appeared to have little effect on the subsequent use of the service (KNAPP, 1980:118).

In view of the reports in the information science literature about the effects of fees upon user satisfaction as reflected by demand, the researcher would suggest that this factor should be incorporated in any study on information behaviour.

3.4.3.1.2 Timeliness of search

In Europe and the United States of America the physical location of a data base vis-a-vis the location of the user is such that the time between the user requesting a search and the user receiving the output by post is less than a week. In the South African context, geographical distances impose a delay of at least two weeks between the request by the user being dealt with and the results arriving by post (cf 2.2). This time factor has not been dealt with specifically in any of the literature studied by the researcher, probably because it is a factor beyond control. Maier (1974:182), however, has mentioned a delivery time of between 11 and 22 days for search results to reach the user, but with no comment being made as to user reaction on this.

In view of the local circumstances and delivery times the researcher would suggest that this aspect could influence user satisfaction and should be examined in any user study of information services in South Africa.

3.4.3.1.3 Satisfaction as influenced by interaction with service staff

The reaction between the user and staff has been suggested by Tessier in the preceeding chapter (cf 3.4.3) as a factor which could influence satisfaction with the service. The use of a search analyst or search intermediary to conduct the search on behalf of the user is common practice in America and it was reported in 1978 that of 708 centres conducting searches on the MEDLINE database the great majority had a search analyst perform them without the user being present (WERNER, 1979:9). The search intermediary is an information specialist who by virtue of expert knowledge of the database being searched is able to convert the request of the user into a strategy which will retrieve

material accordingly. Without this special knowledge it could be difficult for a user to obtain meaningful results from the database. The search intermediary may be the only person with whom the user has contact about the search and it is possible that the attitude of such staff could influence the satisfaction of the user as to the final outcome of the search.

The user may, however, be present during the online session, and this has important implications for the time spent online and any benefit derived from the presence of the user must be compared to the value of his time spent on other tasks. Morris et al (1982:301) conducted a study where the same search was performed twice - once with the user present and once without the user, each search being conducted by a different intermediary. The number of relevant references obtained and subsequent user satisfaction showed significant increases when the user was present during the search process. However, bias may have been introduced by the fact that 80% of the participating users in the study were present by choice and were thus favourably disposed towards being present. Other studies have shown that users prefer the search to be conducted by an intermediary because of the better results obtained (MARTIN, 1974:80; WILLIAMS & CURTIS, 1977:6). It would appear from the literature that the use of an intermediary to conduct the search could be a factor which could influence user satisfaction. The researcher would therefore suggest that this factor should be considered in any study of user satisfaction.

3.5 Variables which influence information seeking behaviour

In discussing the needs of the user after examining the views of several authorities, the conclusion was reached that only the expressed needs of the user could be measured (cf 3.4.2). It was also concluded that one of the problems in doing so was the individuality of each user's needs and the consequent problem of reconciling the measurements. Wilson (cf 3.4.2) has suggested that the expressed needs of the user is manifested as information seeking behaviour and thus a study of such behaviour, it is suggested could be an indirect measurement of the needs of the user.

3.5.1 Age, Rank and Qualification

The age of the user, and the rank of the respondent, are central concepts in several studies where they were considered as factors which may influence information seeking behaviour. Bellardo (1981:200) in reporting upon such studies considers that mature researchers were too established in their habits to be receptive to the introduction of such radical measures as online searching. The converse was demonstrated by the enthusiastic response of students to such facilities. In a survey of the users of an industrial current awareness service, attention is drawn to the conclusion that mid-career or established scientists tend to resist changing their literature habits (WARDEN, 1978:463). This conclusion is also confirmed by a study on users and non-users of online search services both in academic and industrial spheres. Age was shown to be highly related to use, with older persons in either setting least likely to be users. In this study the level of degree held was also related to information seeking behaviour and holders of a doctoral degree or doctoral students were found to be most likely to use the

service. In the academic setting, the senior ranks such as professor were less likely to use the service (BAYER & JAHODA, 1979:98-99). Thus it would appear that the age and rank variables would merit inclusion in a study of information behaviour.

3.5.2 Work Activity Factors

In a study which investigated the differences in information seeking behaviour between non-users and users in two work environments, negligible differences were found between chemists working in an industrial setting on the one hand and a university chemistry department on the other hand. The comparison between user and non-users was done within each environment (BAYER & JAHODA, 1979:104).

Tagliacozza (1973:170) in reporting upon the users of the MEDLARS system pointed out that the goal of NLM was to provide references to the biomedical literature to a wide spectrum of medical workers. In this study, however, it was found that the users of the system were more likely to be engaged in the pursuit of knowledge than the treatment of patients. Brown & Agrawala (1973:37) identified a similar but less marked pattern when they conducted a similar investigation and reported that more of their medical respondents were involved in research rather than patient care. Tagliacozza (1975:298) in a further study on MEDLINE concluded that there was no doubt that the main use was in the area of research as opposed to patient care.

The information needs and behaviour of the general practitioner, as a distinct segment of the medical population, have also been studied and it is reported that they have little or no need for, or indeed no use for computerised

information systems (RENFORD & EAGLESON, 1982:46; STRASSER, 1978:205). In a wide study of information usage patterns and stated needs of the medical community in Great Britain, significant differences in reasons for seeking information were reported between doctors working in hospitals and general practitioners. The work activities of teaching, research and the preparation of papers or talks were found to influence their information seeking behaviour. Hospital doctors had a significantly greater need for information for these purposes as opposed to the general practitioner. When the same respondents were questioned as to how important they considered these aspects from the view of their personal needs the hospital doctor sample ranked these aspects as much more important than did the general practitioner sample (COCKERILL 1981:2-3). A similar pattern was exhibited by the respondents in another survey of the medical profession in Great Britain (FORD et al 198:15).

In an early study of MEDLINE it was reported that research, publishing and academic requirements accounted for the great majority of the requests received (TAGLIACOZZA, 1973:176). A recent survey during 1982 of online searches conducted on the MEDLINE data base in Australia, showed that of the total of 9 000 searches carried out, 70% were done for users who were engaged in research in medical schools (AUSTRALIAN MEDLINER, 1983:15).

It would appear therefore, that in the medical community at least, differences in information needs are influenced by the type of work activity and therefore in satisfying these needs, different approaches to obtaining information may be adopted by each category. The researcher, therefore, concludes that the type of work activity should have an influence on information seeking behaviour.

3.6 Channels of Information

Meadows (1974:91-3), in discussing the acquisition and use of scientific literature by individuals, stresses that the study of information acquisition involves more than the simple question of availability of information. He emphasizes that the manner in which information is made available is important because this will influence the behaviour of the user in the relative use of the various information channels. Meadows defined two type of information channels, the first he termed formal channels, sometimes also known as archival channels, usually of a written nature. The second category he referred to as informal channels which are usually oral in nature, such as the oral communication between colleagues. Smith (1981:118-9) considered that the definition of channels of information as given by Meadows could be subdivided into direct channels which provide the actual information and indirect channels which lead to information. Meadows (1974:108) in discussing the information gathering habits of scientists concludes that research workers in pure science tend to obtain relatively more of their information requirements from formal channels than do research workers in the applied fields who tend to rely more on informal sources of information. This view is supported by Allen (1981:5) who considers that the channels of information used by the scientist will depend upon the nature of the work done. In light of these views it would appear that in any study of information behaviour the channels of information used should be examined as they reflect an important aspect of information seeking behaviour.

3.6.1 Informal channels of information

Most scientists consult colleagues to obtain information for professional purposes but the frequency of use of this channel of information in relation to other methods may be influenced by the type of work activity of those seeking information. Ford (1980:18) reporting on this aspect found that general practitioners and medical researchers use this method more than biochemical researchers.

In a study of the information needs of general practitioners, the type of information which they required was considered to be more readily obtained from colleagues, either as advice, or feedback from patient referrals. The information need of general practitioners was more likely to be satisfied by this technique than by formal information seeking behaviour such as using a library (LOR, 1979:58). Similar findings were reported in other studies where consultation with colleagues was ranked high on the list of information channels used by doctors (STRASSER 1978:205; STINSON & MUELLER, 1980:140; RENFORD & EAGLESON, 1982:47). The consultation of colleagues has also been discussed frequently in studies of information flow and in many cases this method ranks only second in importance to journals as a communication channel (STINSON & MUELLER, 1980:141; FORD et al, 1980:18; WOOD, 1971:15).

3.6.2 Formal channels of information

As reported earlier (cf 3.6) these channels may be considered as belonging to two basic categories, direct channels which contain the information being sought or indirect channels which lead the user to the information.

3.6.2.1 The formal direct channels of information

Most studies investigating the use and relative importance of direct channels of communication show that journals are highly rated as an information channel, particularly for current awareness purposes. In these studies the location of these journals, whether they are held in a library or privately, is generally not revealed or investigated and may be only inferred in some instances from references to subscriptions to journals or 'personal' journals (STRASSER, 1978:205; CHEN, 1974:279; STINSON & MUELLER, 1980:142; MURRAY-LYON, 1977:99; CARSON & WYATT, 1982:39; FORD et al, 1980:18).

3.6.2.2 The formal indirect channels of information - the secondary literature

The secondary literature, as a source of information, has been investigated frequently and in the context of this study this is taken to refer to the abstracting and indexing journals which report on the primary literature and lead the user to the original source of information. In a study which reported upon the use of the publication Index Medicus, only half of the respondents said they used it and the frequency of use was less than once per month (STINSON & MUELLER, 1980:143). General practitioners were reported as seldom or never using indexes or abstracts as a source of information (RENFORD & EAGLESON, 1982:47). This finding was confirmed by the study carried out by Ford who did, however, state there was a difference between general practitioners and hospital doctors in that the latter used the secondary

sources more often. He also found that biochemists made the greatest use of this information source amongst the various disciplines studied (FORD et al, 1980:17). Carson & Wyatt (1982:39) reported in a study of information sources used by microbiologists that Index Medicus was used by the majority of the respondents for specific searches but only a minority used it on a regular basis as a search aid. This source was ranked equal in importance with colleagues as a means for seeking information by the respondents. Attention was drawn to the problems involved in using such reference tools because some knowledge of their method of compilation was required to obtain the best results from them. In a comparative study of information seeking skills between medical students and physicians it was found that secondary sources of information such as Index Medicus were used by most respondents in the study but that incomplete knowledge of the structure of the index resulted in most users failing to obtain maximum benefit from it. Ratings of the efficiency of the data collection process revealed little difference between the two groups (DA ROSA et al, 1983:48).

3.6.2.3 The formal indirect channels - libraries

An important aspect of information behaviour is the way in which the user is led to, or gains access to, information. This route of access is also an indirect information channel, the most important and commonly studied channel, as reflected in the literature, being the library. Ford et al (1980:21) measured the use of libraries by doctors and found that very few general practitioner respondents visited the library more than once a month while hospital doctors visited the library on average more than once a month. Only a minority of general practitioners would travel to another library to obtain

information they failed to obtain locally. In a similar survey communication links between the doctor and the librarian were described as 'often poor' and dismay was expressed that many doctors did not know how to use the library (COCKERILL, 1981:7-8).

In a study where doctors were asked to rank their use of information channels, libraries were shown to be ranked below other sources, such as colleagues and private information files. Younger doctors tended to use libraries more than older doctors and the research doctor or hospital doctor made more use of such facilities. A difference was also shown where the rural practitioner used such facilities less than his urban colleague (STRASSER, 1978:206). These patterns were also revealed in a study of the information habits and needs of 'health professionals' in which it was shown that only 23% of respondents used a library more than once per month and 48% visited their library less than once a month or not at all. Doctors in single practices used libraries less than those in group practices or institutions (STINSON & MUELLER, 1980:141).

A different pattern was revealed in a study of medical microbiologists where it was found that the majority of the respondents used a library regularly on a weekly basis and only a minority less than once a week (CARSON & WYATT, 1982:169). Curtis (1977:283) surveyed the information seeking behaviour of active research bioscientists with special emphasis on their attitudes towards online searching. In the sample half the respondents belonged to a medical faculty but libraries were listed by only one third of the total respondents as a primary channel of information. This figure may be conservative as other sources used, such as journals and indexes, amounted for a further half of their responses.

From the literature studied and reported above the researcher has concluded that the use of libraries as a channel of information would appear to be influenced by the factors stated by Lor who maintained that the key to information needs is to be found in the problem solving and related intellectual activities of the user. The researcher would suggest therefore, that the use of this channel of information would appear to merit consideration in the study of information behaviour.

3.6.2.4 The formal indirect channels of information - private reference collections

Private reference collections are generally considered to be important sources of information for any research worker or professional practitioner. Such a system will lead a user to information, as would a library, and thus, could be considered to be an indirect channel of information. The researcher located two studies in which private reference collections were reported upon as a channel of communication. Stinson and Mueller, in a study of information needs, reported that nearly all respondents stated they often used this source of medical information as opposed to libraries (STINSON & MUELLER, 1980:141). Strasser (1978:205) in a survey of information channels employed by physicians reported that personal information files were ranked only second in frequency of use to colleagues, as channels of information.

One study of general practitioners did not solicit information on personal collections as such but rather sought details of journal ownership. The group studied was composed of family physicians who met weekly at their local hospital. The results showed that nearly all the respondents used their

personal journals either regularly or often as a source of information and all of them said they seldom or never used the journals in the library (RENFORD & EAGLESON, 1982:47).

The researcher would suggest that in view of the importance of such a channel of information, as reported above, it should be examined in any study of information behaviour.

3.7 Non-users and online retrieval of information

King and Bryant (1971:242-3), whilst pointing out that non-users are hard to identify, consider they can provide potentially very useful data when evaluating information use. They suggest that a sample should be drawn from this segment of the population and used to determine information seeking behaviour characteristics such as the source of references obtained, whether they are aware of the information systems available and if possible why the system is not used. King and Bryant also suggest that differences in characteristics between users and non-users may reveal reasons for non-use, especially the lack of system awareness. Rowley and Turner (1978:119) also consider knowledge of the information needs of the non-user to be an essential pre-requisite to the planning of an information service but conclude that the problem of the identification of this group is considerable. Lancaster (1978a:32) makes the point that by studying only the demands made by users of an information system the information service may move closer to the expressed demands of the users. In using such results the tendency would be to emphasize the most frequently occurring demands rather than attempting to understand the needs of the user and ways to increase the awareness of the non-user (cf comments made in 3.3).

The non-user has rarely been studied, as they are not easily identifiable especially in relation to the utilisation of computerised databases. In the literature survey conducted for this study it was considered advisable, in view of the short history of development of such databases (cf 1.1) to seek figures only from recent studies to indicate the extent of the non-user population. Figures derived from studies conducted in the early 1970's would reflect the position when online searching and services were still in the embryonic stage and many of the results of such studies may not apply to the present situation. In a study of users of online services in both an industrial and academic setting it was found that only 12% of the respondents in industry had used this method of obtaining information. In the academic setting 32% used online systems to obtain information (BAYER & JAHODA, 1979:102).

In an extensive survey of hospital doctors and general practitioners in Great Britain it was found that over half of the hospital doctors never used MEDLINE and very few of them used it more than once per month. Even lower figures were quoted for the general practitioners in that the majority never used the MEDLINE database (FORD, 1980:18). These figures confirm the findings of Strasser (1978:206) who found that most of the general practitioners in her survey had never used MEDLINE. Stinson and Mueller (1980:142) report similar figures and in a similar survey, with a small population, it was found that none of the participants used MEDLINE (RENFORD & EAGLESON, 1982:47). It would appear from the above studies, therefore, that the use of online services is neither the first choice nor regular method whereby information is obtained by physicians. Differences may appear when the type of work activity is considered as was discussed earlier (cf 3.4.2).

The researcher would suggest that in any study of information behaviour the attitudes to, and the use of computerised literature searching should be investigated.

3.7.1 Awareness of channels of communication by non-users

One very good reason why non-users of an information resource fail to use the services offered is that they may not be aware of either the resource or its services. This situation was revealed in a study of information transfer where it was found that the majority of respondents were unaware of services offered by information centres (BADRE & HUGHES, 1974:124). Bond (1982:86) in a survey of paramedical personnel found that 35% of the respondents were not aware of the information services available to them.

Several studies have covered the aspect of how the user becomes aware of the services available and the most common finding was that the majority of respondents had heard of the service by word of mouth, whereas the library, as a source of creating awareness, was generally ranked second to this (HOOVER, 1976:141; McCARTHY, 1974:369; BEELER, 1981:63; LOWREY, 1981:31; BOND et al, 1982:86).

The researcher would suggest in view of the above reports, that in any study of information channels with reference to computerised literature searching it would be advisable to obtain data on

- a) the awareness of the respondents to the availability of services,
and
- b) the manner by which the availability was made known to the
respondents.

CHAPTER 4

THE METHODOLOGY OF THE EMPIRICAL STUDY

In this chapter the researcher will defend his choice of research method. The literature pertaining to the major methodologies employed in user studies will be reviewed briefly, the suitability of each method for the project in hand will be discussed succinctly and the reasons for the final selection of a methodology for the present study will be presented.

Scientific research can be one of two types, one being basic research, the other applied research. The first seeks to provide a fuller understanding or explanation of events without the motivation of the application of these findings, and tends to be theoretical in nature. The other is directed towards producing results which may be used for problem solving or which can be applied in a practical manner to a given situation (BUSHA & HARTER, 1980; 7-8).

In the social sciences applied research is generally undertaken and two types of approach can be identified. The first type, called descriptive research, aims at exploring the subject of the study with the intention of identifying hypotheses upon which to conduct future research. The second type, called exploratory research, places the emphasis on the establishment of links between various factors to show a cause and effect relationship (FORCESE & RICHER, 1973:81).

A study of the literature on the various approaches to research methodology in social science research showed that there is no common agreement about the difference between data collection and research methodology but it would appear that the most commonly used research method was the survey method, especially where user studies were undertaken (BABBIE, 1973:32-9; BLALOCK, 1970:36; LINE, 1982:32-4).

4.1 Choice of Method

In reviewing the literature pertaining to research methodologies in the field of information science the researcher considered firstly the experimental method. Whilst this technique is useful in exploring relationships between variables and has been used in information studies the disadvantage in its use in the present study would be the close control, which would have to be exercised by the researcher, over the variables to measure relationships (BUSHA & HARTER, 1980:35d 50-1; BABBIE, 1973:32; GOLDHOR, 1972:106-166, KRIKELAS, 1969:508; DWYER 1971: 403). Such tight control would impose impractical restrictions, rendering the method unsuitable for the present study and therefore the method was rejected by the researcher.

The researcher considered secondly the case study method, as it had been reported as also being suitable for establishing relationships between variables. The main thrust of the method is the gathering of a large amount of data, generally by direct observation on a single entity (BUSHA & HARTER, 1980:151, BABBIE, 1973:38; GOLDHOR, 1972:129-31; FORCESE & RICHER, 1973:82). The great disadvantage of such a method is that the results so obtained cannot be generalised to explain more general phenomena and relationships. The

limitations are of such a nature that the researcher rejected the technique for this project.

Thirdly, the researcher considered a technique known as the Delphi method. This may be considered as a type of survey technique as the data is collected by soliciting opinions from respondents, refining the results and subsequently reinterrogating the respondents until consensus is reached upon the topic in question (FISHER, 1978:65: HELMER & RESCHER, 1959:47). The chief use of the technique is in forecasting and as the present study was not designed to establish a consensus opinion in such a manner this method was rejected by the researcher.

4.1.1 Surveys

Survey research is characterised by the selection of samples from populations to obtain empirical knowledge of a contemporary nature. Information can be obtained about the population being studied without undertaking an examination of all units in the population (BUSHA & HARTER, 1981:54).

The use of surveys in library and information work has a long history and it is recorded that in 1876 a survey produced data on public libraries in America (LANCASTER, 1978:302). Since then this method has been the one most frequently used in studies in the field of library and information science.

Surveys can be of two distinct types, either descriptive or analytical. The descriptive survey records data either in tabular or narrative form or both, and can be described as a status survey. Such surveys were commonly used

between 1930 and 1950 in library research and were designed to present data on library conditions rather than to test a hypothesis. This type of survey is carried out with the assumption that the analysis of the data collected will provide information upon which to base management decisions (BUSHA & HARTER, 1981:165, GARDINER, 1980:12; GOLDHOR, 1972:119).

The analytical type of survey seeks to collect data on the population being observed and to establish a causal relationship between the factors which are examined in the survey (LANCASTER, 1978:300). This type of survey has been more in evidence in recent years, especially with the advent of computerization in the library, and it is the most common type of research methodology used in present day use and user studies (LANCASTER, 1978:302). An analysis of trends in the use of various methodologies in a bibliometric study of library science research clearly shows the increase in the use of survey methods, an increase of some 200% being recorded between 1965 and 1975 (PERITZ, 1980:257).

Lancaster draws attention to the numerous criticisms that have been levelled at user surveys by several authorities, but it would appear that the majority of the criticisms concern the methodology and design aspects of the technique rather than the technique itself (LANCASTER, 1978:308). Busha, in contrast to Peritz, considers that the use of the survey technique is declining and that it is being replaced by more exacting methods designed to probe more specific library problems (BUSHA & HARTER, 1980:166).

Goldhor (1972:120) considers that the survey method has many advantages for library and information science research by showing not only causal effects between variables, but by providing a mechanism to also prove the negative

aspects of a hypothesis. The method lends itself to the study of a large number of cases which are geographically dispersed and to the measurement of the effects of variables which cannot be deliberately introduced by the researcher.

The researcher decided that the survey method of research is suited for use in this project for the following reasons:

1. The technique permits sampling of a population or units of a population to allow an understanding of the larger population (BUSHA & HARTER, 1980:88, BABBIE, 1973:47).
2. Data can be collected from samples of the population by means of questionnaires and this data can be used to test hypotheses (BUSHA & HARTER, 1980::88).
3. The format permits the consideration of many variables which can be tested in explanatory models to permit causal relationships to be identified (BABBIE, 1973:47).

4.1.1.1 Retrospective Surveys

The retrospective survey or ex post facto study is one in which existing data are examined and analysed in order that causal relationships may be revealed. A flaw in this approach is that pseudo relationships between cause and event may be apparent because of factors which are not revealed by the study (BUSHA & HARTER, 1980:43). This approach depends heavily upon recall by the subject

of past behaviour and its validity can be questioned on these grounds (FAIBISOFF & ELY, 1976:273). In a retrospective study two groups are usually studied. In one the factors whose influence it is wished to explain or explore are present, whilst in the other, known as the control group, these factors are absent. Such a study is called retrospective because the comparison is made using data derived from existing records relating to the population being studied, such records being created as a result of their interaction with an organisation (MAUSNER & BAHN, 1974:312).

The advantages of this method are its relatively low cost and the existence of records from which samples can be drawn. The disadvantages are that although sample units may be easily identifiable for further questioning if the existing records cannot supply all the information needed, the researcher is then subject to the uncertainty of memory recall by the respondent. Bias may also be introduced by events subsequent to the time period covered by the survey, influencing the recall of respondents. The selection of the control sample can also present a difficulty in the method (MAUSNER & BAHN, 1974:19-20).

In the present study to obtain the size of a sample required for analysis it would be necessary to obtain responses from some users who had used the system six months prior to the study. This would expose the collection of data to the vagaries of memory recall as discussed previously and on this basis the method was rejected as being unreliable.

4.1.1.2 Prospective Surveys

This method entails selecting a sample for study and then examining it for the influence of the factors under examination. The sample can be selected on the most suitable basis for the area of the project. Prospective studies can permit comparison of the units of analysis deemed to be exposed to the factors and these known to be unexposed (MAUSNER & BAHN, 1974:322).

A major advantage of this method is that the groups are selected on the basis of their exposure to the factors to be studied. Thus the examination of many variables can be achieved and bias can be eliminated. The disadvantages are that more expense is involved, a large sample is needed, and attitudes may change over the survey period (MAUSNER & BAHN, 1974:323-4).

The researcher considered the above arguments and decided that the validity and reliability of the information were of sufficient importance to outweigh the disadvantages of this method. The wider scope of this type of survey was also a favourable factor. The change of attitude over time was not a factor which could influence this study, as attitudes would be examined at a set time in the information retrieval process in the case of users and at the point of answering the questionnaire in the case of non-users.

A prospective survey was therefore selected as the most appropriate method for this study.

4.2 The Design of the Survey

It is clear from the foregoing arguments that studies of the user must be well planned and constructed if results of any value are to be obtained. The population must be scientifically tested and the approaches to data collection must be critically examined to determine their reliability and validity (LANCASTER, 1978:309; LINE, 1982:24-5). Kee, however, in discussing these aspects questions the too rigorous application of these measures and suggests that even an imperfect study can yield valuable results (KEE, 1960:433).

4.2.1 Longitudinal Surveys

When the change in the factors to be measured is studied over a period of time, i.e. the trend is measured, then the type of survey used is known as a longitudinal survey. This type of investigation lends itself particularly to measuring the change in attitude of populations, and this can be achieved by studying the general population or a cohort or a panel (BABBIE, 1973:63-4). This type of survey is not suited for this study as the researcher does not intend to measure a change in attitudes, but rather attitudes at a point in time.

4.2.2 Cross-Sectional Surveys

This method provides for the collection of data from a cross section of a population at a given point in time. It permits the collection of descriptive data as well as analytical data which may be used in the testing of variables in the study (BABBIE, 1973:62).

In the study planned it will not be possible to collect the data simultaneously from the units sampled owing to the fact that the sampling units of the user group do not present themselves at one time (cf 5.1.1). The time element can still be valid, however, as in the case of the user population, the data can be collected at a time in information seeking process which is common to all. In the case of the non-user population the data can be collected within a relatively short time period from the respondents.

In a variation on the above designs, called parallel sampling, the responses from one population are compared to that from another (BABBIE, 1973:67). The selection of the design of a study is largely determined by the problems inherent in the study. The researcher does not intend to sample the two populations over a period of time in order to obtain data about change in attitude but rather with the objective of measuring the behaviour and attitude of the subjects at a particular period in time. It has already been stated that this period in the case of the user population should be coincidental with a certain stage in the information seeking process and in the non-user study within as short a period as possible (cf 4.1.4.2). In the light of these factors the selection of a cross sectional type of survey conducted in parallel would be the best approach.

4.3 Variables

The term variable is used to describe an element or factor involved in research. The term qualitative variable is applied to a factor which cannot be quantified such as race, religion, occupation type or qualifications.

Where a variable can be expressed in a quantitative fashion, for example age, it is called a quantitative variable. Both types of variable will be involved in the present study.

Variables may also be classified according to their relationship. A dependent variable is one whose changes or different states are explained or predicted in the course of an empirical study. An independent variable is one which causes the effect measured through the dependent variable (BUSHA & HARTER, 1980:9-10).

In this study one of the chief aims is to test whether there is a significant difference in the information seeking behaviour of biomedical workers who use a computerized information service and those who do not. The dependent variables in this study will be the information seeking behaviour of the respondents whilst the independent variables will be the age of respondents, their rank and occupation type, and their use or non-use of IML facilities.

4.4 Data Collection

In conducting user surveys the prime object is to obtain data from the population being sampled and there are several methods of doing this. The object of this section will be to discuss these and indicate the reasons why the method used for this study was selected.

4.4.1 Interviews

An interview permits the maximum interaction between the subject and the researcher and makes possible the retrieval of more complete information on the questions in the survey than any other method (BUSHA & HARTER, 1980:78; ISAAC & MICHAEL, 1981:138-9).

The data gained from an unstructured interview where the questioning is allowed to develop naturally may tend to provide impressions of attitudes, alternatively the data may be quantified by the interviewer scaling the responses (KING & BRYANT, 1971:238). If the respondent misunderstands a question clarification may be obtained immediately, thus permitting reliable data to be collected (BABBIE, 1973:172). Several authorities caution that the interviewer must be well versed in the art of interviewing and play a neutral role so as to minimise any bias due to the face to face technique (KING & BRYANT 1971:238; BUSHA & HARTER, 1980:78; BABBIE, 1973:173). If a structured interview technique is used with an objective questionnaire as the basis for the series of questions posed, then the possibility of bias can be overcome. Accurate and complete information can be obtained by this method (ISAAC & MICHAEL, 1981:138).

Group interviews, where several respondents meet simultaneously with the researcher, have an additional advantage in that they may produce more frank responses because of group interaction. The attitudes of respondents may be more clearly expressed and elaborated upon owing to the interactive support of the group (KING & BRYANT, 1971:238). There is a danger in the group interview method that the interviewer may lose control of the trend of the discussion or that persuasive or prestigious individuals may shape opinion,

and some individuals may hesitate to alter previously stated opinions (ISAAC & MICHAEL, 1981:114; FISCHER, 1978:64). This is a danger which the Delphi technique seeks to avoid (cf 4.1).

The interview method of data collection thus has several features to commend it. There are, however, aspects inherent in the present study which the researcher felt must be considered before reaching a decision on the use of this method. Firstly as described previously (cf 1.2.1) the geographical distribution of the population of users had to be considered. The spread of the population in the present study would present considerable practical difficulties in reaching the users in the sample should they be personally interviewed. Secondly the interview with each user should ideally take place at the same stage of the search evaluation process and this would present practical difficulties in arranging interviews. Thirdly as the sample units of the user group would only be identified when each unit requested IML to conduct a search, this would compound the practical difficulties of the last point. These aspects presented such great practical problems that the method was considered to be unsuitable for this study.

4.4.2 Self Administered Questionnaire

Self administered questionnaires provide a means of obtaining data without communicating directly with the respondent. This method has the advantage of making it relatively easy to obtain data from large numbers of samples. The questionnaire may be distributed by post or by hand delivery and it may be directed to the work address or the home address depending upon the circumstances of the survey. It is considered that personal delivery or

collection is preferable to postal delivery as this appears to evoke a higher completion rate (BABBIE, 1973:159).

The disadvantages of the self administered questionnaire have been listed by several authorities and these have been considered by the researcher. The principal disadvantage of this method is that the researcher has no opportunity to question the respondent to obtain clarification of ambiguous or incomplete responses. Thus some data may not be collected and there is no opportunity for the collection of useful background material (BUSHA & HARTER, 1980:63).

If the questions are not carefully structured, the responses may be ambiguous or questions may be misconstrued resulting in response error. Responses may reveal attitudes and actions but the underlying reasons for these cannot be determined, nor can values be measured readily by this method (KING & BRYANT, 1971:239; BUSHA & HARTER, 1980:63; ROWLEY & TURNER, 1978:57). If the questions are not carefully constructed they may not be understood by respondents, or they may mean different things to different respondents (ISAAC & MICHAEL, 1981:130).

There is a danger that within the population of recipients of the questionnaire, there will be some who are, on principle, against postal surveys - or even surveys, and who therefore will ignore the form. Contrary to this there may be within the respondent population, those who may be more likely to complete and return the questionnaire than others because of opinions they hold. Both aspects may result in a biased response (KING & BRYANT, 1971:239; BUSHA & HARTER, 1980:63). Finally this method generally carries an inherent danger of a low response rate and follow-up reminders will be required to maximise response (ISAAC & MICHAEL, 1981:131; BABBIE, 1973:163-4).

This method of data collection has, however, several important advantages which should be considered. The technique permits a wider range of sampling for the same amount of input than does any other method (BUSHA & HARTER, 1980:62; ISAAC & MICHAEL, 1981:130). This is an important consideration in view of the size and geographical distribution of the population to be studied in this research project.

The absence of a researcher at the point of data collection offers the respondent the advantage of providing frank answers and if the ethics of the research are sound, the response can be made in complete anonymity (BUSHA & HARTER, 1980:62). Further advantages are 1) the data collected can concern the background of the respondent and be quantitative in nature; 2) if the questions are correctly framed the responses can provide an insight into the problem; 3) the collection of data from large numbers of respondents can be achieved in a relatively short time; 4) the fixed format of the questionnaire can help to overcome variations in the response to the questions (BUSHA & HARTER, 1980:62).

In weighing the advantages and disadvantages of this method the researcher also had to consider the background of the population to be surveyed, the wide geographical spread of the respondents forming a substantial section of the population, and the time over which data should be collected.

After consideration of the advantages and disadvantages of the methods of data collection dealt with in the preceding section (cf 4.4.1), the researcher decided to use the self administered questionnaire technique. The reasons for this are firstly that this technique would permit a wider range and

distribution of sample than would the interview method (BUSHA & HARTER, 1980:62); secondly it would permit the collection of a relatively large amount of data in a short period of time (BUSHA & HARTER, 1980:62) and thirdly it would be self administered and thus allow respondents to deal with it in their own time (ISAAC & MICHAEL, 1981:130).

4.5 Unit of Analysis

Social surveys in the human field are concerned with people, groups of people or institutions and there may be several units of analysis in one survey. The data collected with reference to the units analysed can be manipulated and extrapolated to describe the population represented by the unit of analysis.

The universe of biomedical workers who can potentially utilise the services of IML can be categorised according to many criteria. The population can be broken down by geographical areas, by discipline, by language, or by qualifications. It was considered that the unit most suitable for analysis would be the individual. No valid reasons could be found for selecting another classification and thus the individual user or non-user was selected as the unit of analysis in this survey.

CHAPTER 5

THE EXECUTION OF THE SURVEY

5.1 The Population of the Survey

The concept of a population is a fundamental part of the survey method of research. The population has been defined as a set of people or things which have at least one characteristic in common (BUSHA & HARTER, 1980:56-7). Babbie (1973:80) defines a population as 'the theoretically specified aggregation of survey elements' and also defines a survey population as 'that aggregation of elements from which the survey samples is actually selected'.

The MRC, in terms of the Act by which it was created (cf 1.2.1), provides an information service to all biomedical research workers in South Africa. In practice the service is used by those workers who are not attached to the Universities of the Orange Free State, Pretoria and the Witwatersrand as these organisations operate their own information services under the aegis of the MRC-NLM agreement (cf 1.2.1). Thus the population from which the survey population was drawn, is the total number of biomedical research workers in South Africa less that segment serviced by the above universities.

Within this population there are two elements which concern this study, firstly the user population and secondly the non-user population.

5.1.1 The User Population

The existing user population can be identified in part by using the records of IML to obtain details of names and organisational affiliations of those who have already had searches conducted by IML. Within the total user population there is a segment of users who cannot be identified, as they fall into the category of beneficiaries as defined by Wersig (cf 3.3). These beneficiaries have searches conducted on their behalf by the user, who presents the search to IML. They are not easily identifiable for this reason. The user population is also continuously expanding as each day new users request searches to be done by IML. It is possible, therefore, to study the existing population as it stands or the expansion segment of the population as it is presented to IML.

5.1.2 The Non-User Population

The total non-user population in this study consists of those biomedical research workers who could use the services of IML but had not done so according to the records of IML at the commencement date of the study (cf 5.1.1). This population consists of two segments, the first being those who have not used IML at all, and the second those defined as beneficiaries by Wersig (cf 3.3). The latter have had searches done for them by a third party who presented as a user to IML. The non-user population will also change in time as non-users become users.

A list of non-users could, in theory, be obtained by compiling a national list of biomedical research workers and comparing it with the records of IML, but

there are tremendous practical difficulties in preparing such a list due to the scale of the operation involved.

5.2 Sampling

The survey method requires that the survey population should have a sample selected from it, for the purposes of the survey, which should be both logically and statistically sound and defensible. It will therefore be necessary to examine the population for its integral parts and then to select the sampling method most appropriate to the population type (LEEDY, 1980:117).

Populations have certain general characteristics. They may be homogeneous, i.e. the units in the population have similar characteristics. The population may consist of layers or strata and the units may have similar characteristics, within each stratum but show a difference in characteristics between strata. This is known as a stratified population. The number of units in each stratum may differ between the strata. The population may be composed of clusters of units whose cluster characteristics are similar, but within each cluster the units may not be homogeneous in characteristics (LEEDY, 1980:117).

To arrive at an appropriate sampling method certain steps must be taken. The population must be identified, its structure analysed and its characteristics assessed. The sample must then be selected from the population using the most suitable randomisation method (LEEDY, 1980:118).

5.2.1 Random Sampling

Simple random sampling is a method of sample selection by which all members of the target population have an equal chance of being selected. To provide results which are representative of the population and have a high confidence level, samples must be selected from a complete list of the population under study. If such a list cannot be obtained, any samples drawn using this method cannot be regarded as typical of the population. The results therefore cannot represent the population (BABBIE, 1973:89; FORCES & RICHER, 1973:125; BUSHA & HARTEK, 1980:56).

5.2.2 Systematic Sampling

Systematic sampling is almost the same as random sampling but in this method the sample is drawn according to a predetermined sequence from a list, the first sample being selected at random. To avoid organisational bias in the preparation of the list is not easy, and the prime factor here again is ensuring the inclusion of all members of the population on the list (BABBIE, 1973; FORCESE & RICHER, 1973:127). Forcese and Richer (1973:128) recommend that lists arranged in alphabetical order of names be used for this method as this should provide samples which are virtual replicas of the population.

5.2.3 Stratified Sampling

This is a modification of the two techniques discussed previously. It is a method used where the population is not homogeneous and therefore the sampling

error will, as a result, be greater. The population is classified into homogeneous strata and the appropriate samples are drawn from each strata. Once again the provision of a complete list is the essential starting point (BABBIE, 1973:94). With a complete list stratification can ensure that proper representation is achieved, and the sample is more likely to be representative than a simple random sample (BABBIE, 1973:95; FORCESE & RICHER, 1973:131). This method is known as simple stratified sampling, but a problem arises if the populations of the strata are significantly different in size. In this case the sample size for each stratum should be proportional to the size of the stratum in relation to the entire population. This is known as proportional stratified sampling (LEEDY, 1980:120)

5.2.4 Cluster Sampling

The preceding sections deal with sampling procedures to be used when a list of the population is available. In certain situations no list is available and it may be impractical to construct one. Examples quoted of such situations are populations of a city or a country or of all universities in a country (BABBIE, 1973:96). In such situations the technique of cluster sampling may be used to obtain the sample population (BABBIE, 1973:96; FORCESE & RICHER, 1973:133; LINE, 1982:34). Where the population to be sampled has been identified as one which can be divided into sub-populations, each having similar characteristics, then this technique is generally used. Leedy (1980:118, 119-20) cites examples where such a method could be used, for example, a survey of the nation's air terminals or a survey conducted in a large city. Cluster sampling entails identifying the clusters each of similar characteristics within a population, and sampling within the cluster. It is

not necessary for the units within the cluster to be homogeneous (BABBIE, 1973:97). Each sample should be selected to represent all the elements within the cluster in order to minimise the loss in accuracy (BABBIE, 1973:99). Halperin (1978:332) argues that cluster sampling as opposed to random individual sampling could be used to advantage in information work and that the clusters could be sampled during systematically selected time periods. Halperin also states that the larger standard error inherent in cluster sampling is offset by the sampling efficiency and lighter administrative burden.

The researcher considered the characteristics of the population of the survey and noted firstly that the population could not be classed as homogeneous as it is composed of a wide variety of users or non-users in respect of rank, age and other variables. Secondly there are no practical ways of dividing it into strata. Thirdly clusters could be identified in the non-user population on an organisational basis: these comprised the medical faculties of the Universities of Natal, Stellenbosch and Cape Town. In the case of the user population the prospective type of survey was discussed earlier (cf 4.1.1.2) and considered to be the most suitable and a time period cluster could be obtained as users presented themselves to obtain searches from IML over a set period. A final consideration was the practical difficulties of compiling a reliable list of non-users (cf 5.1.2).

The researcher decided that in view of the characteristics of the population, the cluster sampling technique would be the best suited for employment in this study.

5.3 The Questionnaire

It was considered advisable to review studies which reported upon surveys of a similar type before attempting to construct a questionnaire. Copies of the questionnaires used in these studies were obtained from the authors and the format and questions used in them were studied in order to gain the benefit of the experience of the researchers involved (ADDISON, 1980:89; BOND et al 1982:85; HITCHINGHAM, 1979:78; HOOVER, 1976:337; MARKEE, 1981:442; WARDEN, 1978:465; SMITH, 1981:APPENDIX A: HAJAJEE, 1981; MORRIS, 1982:304; WARDEN, 1981:117; TEITELBAUM, 1982:298). These were scrutinised and the format and phraseology, where suitable, incorporated into the questionnaire used for this study.

5.3.1 General Format of the Questionnaire

This section will deal with the layout of the questionnaire and the principles used in deciding upon the division of the questions into broad categories. Consideration of the details as to type of question, phraseology and response scales will be dealt with in later sections. (cf 5.2.3; 5.3.3)

The comparative aspect of the study meant that certain identical sets of questions should be presented to both the user and non-user group in the study and that this set of common questions should be divided into two parts. The first part should seek information which is required for the purpose of constructing independent variables on a personal basis. The second part should be designed to collect information about the information seeking behaviour of the respondents.

A separate and additional list of questions should also be devised for each group in respect of the unique information sought from that group. In the case of users of IML services, the third part would contain questions about the search completed for them which had marked them as users. The questionnaire would be sent with the results of the search and the questions in the third section would relate to the search results and aspects of the service provided by IML. In the case of those identified as non-users of IML services the questions in the third section would relate to their attitudes to computerised database services, with special reference to IML.

There are some aspects regarding the response to a questionnaire that are beyond the influence of the researcher who employs self administered questionnaires. The attitude of the respondent to the questionnaire may be conditioned by the number of questionnaires received in the immediate past (MARTYN & LANCASTER, 1981:8), but if the respondent can see the purpose behind the request for cooperation and thus be motivated, the response rate may be altered positively. If the questionnaire can be linked to some aspect which will rebound to the benefit of the respondent, this may also improve the response rate. An explanatory note on the questionnaire or an accompanying letter can serve these purposes (ROWLEY & TURNER, 1978:70). In this study a letter would be sent with each questionnaire explaining briefly the purpose behind the questionnaire. Copies of the letters are shown in Appendix C of this report.

The length of the questionnaire is a matter upon which a great deal depends as it appears that those which are too long will reduce the recipient's inclination to complete the form. Whilst the number of questions and hence

the length of questionnaire will depend upon the nature of the survey, it is considered wise to keep the form as short as possible (ROWLEY & TURNER, 1978:70). Line (1982:65) suggests that it is not reasonable to expect respondents to spend more than half an hour on completing a questionnaire.

Several sources stress the importance of the physical appearance of the questionnaire and caution against making it uninspiring and dull to complete. They accept, however, that a balance must be struck between producing a work of art and the finance available for the task (ROWLEY & TURNER, 1978:70; BABBIE, 1973:145). The layout of the questions, the style of printing and the spacing should all be planned so as to cause little adverse reaction and to be attractive to the respondent. These aspects also indicate that the researcher is serious about the work, a factor which is important in the attitudes of the respondent (MARTYN & LANCASTER, 1981:8-9).

Line (1982:66) advocates that the questionnaire be designed to provide clear instructions and the questions spaced to avoid confusion to facilitate quick completion by respondents. The provision of boxes for the respondent to check is suggested as one way of allowing quick completion of the questions and at the same time providing neatness to assist in coding (BABBIE 1973:144; LINE, 1982:66).

The researcher took note of these views and the questionnaire would be constructed so as to require a minimum of effort by the respondent to complete. The number of questions asked would be limited and wherever possible respondents could indicate the answers by ticking a box. The questionnaire for users would be printed by offset litho from a typed manuscript on white paper, and that for non-users on yellow paper. This would

be done to ensure that data from each group could be kept completely separate in coding and analysis.

5.3.2 The Construction of Questions

In this section attention will be given to the details of the types of questions to be used. The questions are the only way in which the researcher can communicate with the respondent to obtain data and the responses obtained depend upon the interpretation of the question by the respondent (BUSHA & HARTER, 1980:72). The phraseology and construction of questions form the most important part of the data collection process and will therefore be dealt with in detail.

5.3.2.1 Phraseology of Questions

It is stressed by several sources that the questions asked must be phrased clearly and that ambiguity in the phrasing of a question will certainly give rise to misinterpretation and response error. The same sources stress that careful consideration should also be given to each phrase in order to eliminate excess verbiage (MARTYN & LANCASTER, 1982:9; BUSHA & HARTER, 1980:73).

Questions which are likely to give offence, leading questions, or biased questions will all seriously detract from the worth of the questionnaire as the responses may be influenced and distorted by the nature of the question (ROWLEY & TURNER, 1978:69).

Line (1982:53) advocates the use of plain language in constructing questions and cautions that terminology used by librarians may not be clear to respondents, therefore clarity and precision should be aimed at in the preparation of questions.

5.3.2.2 Open-ended Questions

An open-ended question is one to which the respondent is free to answer in any manner. If the interview technique is used there is an opportunity to clarify responses due to misinterpretation of the question (LINE, 1982:71). If the self-administered questionnaire technique is used there is no such opportunity and thus a variety of responses to the same question may be obtained. This may not be in itself a bad thing, but the variety of response may be so wide that categorisation of the results is difficult with consequent problems in analysing the data (BUSHA & HARTER, 1980:63). To avoid misunderstanding the replies to such questions, it is advocated that self-administered questionnaires have a minimum number of open-ended questions (LINE, 1982:60). Martyn and Lancaster (1981:23) suggest that open-ended questions, where used judiciously, can add to the study, as they give insight into attitudes and aspects which cannot be obtained easily by other means.

There are occasions when it would be an advantage to permit the respondent to present any strong views on the subject of a question and an open-ended question can thus act as a relief valve mechanism for the respondent. Such comments can often be constructive for the researcher (ROWLEY & TURNER, 1978:68).

In view of these opinions it was decided that the use of open-ended questions would be kept to a minimum and they would be used only in conjunction with multiple choice questions. This is dealt with in the following section (cf 5.3.2.3).

5.3.2.3 Closed-ended Questions

Closed-ended questions are of the type where the respondent is asked to select a response to the question from a list of answers provided by the researcher. This avoids answers being obtained which are not relevant, but also assumes that an exhaustive set of answers to the questions has been compiled and provided by the researcher (MARTYN & LANCASTER, 1981:14; BABBIE, 1973:141). Closed-ended questions are more common in survey research because by their nature they provide more uniform responses, and thus are easier to code without coding error (BABBIE, 1973:141). Busha and Harter (1980:70) consider that there is a danger that closed-ended questions may introduce an artificial element to the response if the question is not carefully phrased, by forcing the respondent to fit a response into one of the answers provided. There is also a danger that the respondent may conceal ignorance in choosing an answer provided rather than having to provide an answer. Babbie (1973:141) strongly advocates that the answers to such questions must be mutually exclusive, but concedes that there may be occasions when this is not desirable, and Martyn & Lancaster (1981:15) agree with this approach. In order that the response categories can be mutually exclusive an exhaustive list of responses must be provided, and it is reasonable to suggest that this may not always be possible or practical. The researcher may then enumerate the major possible responses

but allow an "other" response category to permit the respondent to enter minor aspect responses in this way. Martyn and Lancaster (1981:15) suggest this method and Babbie (1973:141), while allowing this possibility, points out the danger that the respondent may tailor a response accordingly.

Closed-ended questions can be used to solicit information on attitudes or behaviour, and in the view of Martyn and Lancaster (1981:14) the technique of attitude scaling should be considered for questions of this type. This viewpoint is also supported by Line (1982:61), who considers the attitude scaling technique very appropriate in this context. In attitude scaling a graded set of answers is provided to the question, the simplest scale being the dichotomous scale with only two answers in response, YES or NO. This scale is very restricted and it is cautioned that it should be used only where the answer is obvious to the respondent (MARTYN & LANCASTER, 1981:14). This method is useful as a screening device to guide respondents to alternative sets of questions in the list depending on their answer to the questions (BUSHA & HARTER, 1970:71). This screening technique will be adopted in the questionnaire by the researcher in the section designed to obtain information about the respondent's knowledge of IML.

The checklist of responses which is provided by the researcher can be one of three types as defined by Martyn and Lancaster (1981:15). These comprise a list from which the only possible or best response is chosen, or a list from which responses appropriate to the situation being described are selected, or a list in which the respondent is asked to rank the responses according to his preference, attitude or mode of behaviour.

The researcher will use multiple choice questions for most of the questions and wherever possible these will be mutually exclusive. In those questions dealing with information seeking behaviour it is not considered feasible to attempt to list all behavioral responses as this would render the questionnaire too cumbersome. A category of "other" would be added to the choice given to the respondent to check that the main responses had been identified by the researcher.

5.3.3 Scaling of Responses

Rating scales may be used to obtain a ranking by order of the responses to different situations.

A rating scale is the most common method of attitude listing and the number of categories is normally five (ROWLEY & TURNER, 1978:69). The Likert scale is a popular type of scale used to measure attitudes. The respondent is asked to indicate reaction to an assertion by marking the appropriate block. The scale usually extends from the statement "STRONGLY AGREE" to "STRONGLY DISAGREE" with "AGREE", "UNCERTAIN", "DISAGREE" being the intermediate points (MARTYN & LANCASTER, 1981:15; ROWLEY & TURNER, 1978:69; BUSH & HARTER, 1980:74). A weight is given to each response to allow coding to be standardised. A matrix layout of the question and response options is used, but it is considered advisable not to show the weight for each response on the questionnaire as this may influence the respondent (BUSH & HARTER, 1980:75).

A more complex scale designed to test attitudes is the Thurstone scale. In this scale a series of statements designed to test the attitude of respondents

to a situation is constructed by the researcher. The responses are weighted and summated but the scale must be calibrated by pretesting before it is administered to the survey sample (MARTYN & LANCASTER, 1981:18).

The semantic differential scale is a method whereby the respondent is asked to indicate a reaction by marking a point on a scale between two extremes shown by bipolar adjectives such as good - bad, weak - strong, complete - incomplete. The scale may be divided between the adjectives or, if a continuum is used instead of segments, it is known as a graphic scale. A numerical value, normally in the range 1-7, is given to each area or segment on the scale (MARTYN & LANCASTER, 1981:19; BUSH & HARTER, 1980:77).

Martyn and Lancaster (1981:19-22) consider ranking to be a difficult task for respondents especially if extended scales are used. They say that people have difficulty assigning values where the scale is greater than five, and further maintain that with a such a scale most people are reluctant to use the extreme values, especially when judgements or opinions are asked. A better response is obtained for a three value scale. In some situations where respondents are asked to rank their responses only the outside rankings can be taken to be of value, because people are clear about what is useful or useless but less clear about assigning ranks in the middle grades.

It is also suggested by Martyn and Lancaster (1981:22) and Rowley and Turner (1978:70) that to overcome any bias by respondents to a verbal scale owing to choice of words, a pictorial scale such as a Smiley chart can be used. The device used here is a simple cartoon face in seven expressions from 'grim' to 'smiling', hence the name. It is not suitable for behaviour information collection but useful for attitude information collection.

After careful consideration of the foregoing it was decided that the semantic scale type of response would be selected for the majority of the questions in the questionnaire because firstly, this method provides definite responses to the questions asked. Secondly, the main principal options as to responses to the questions can be identified by the researcher, and thirdly, it was considered most appropriate in seeking behavioural information. Where scaled responses are not considered appropriate, multiple choice questions of a mutually exclusive type would be used.

5.4 The arrangement of the Sections

It is known that in the user group there would be respondents who are working in the biological field but not the medical field. Therefore the questionnaire should be designed to obtain data from such respondents as they form a part of the community served by IML.

The questionnaire would be arranged in three parts. The first two parts to be sent to all users and non-users in the study and the third part consisting of two sets of questions, one designed for and sent to users and the other set intended for and sent to non-users.

In the first part of the questionnaire the respondents would be asked to provide details about themselves which would be independent variables in the study. These are organisational affiliation, rank, qualifications and age. A question requesting information as to whether the respondent held the position in a full-time or part-time capacity would also be included as it could have

affect on the non-user group. A question to identify the work activities of the respondent would also be included in this section.

In the second part of the questionnaire the respondents would be questioned as to their information seeking behaviour, resulting in a series of dependent variables. Multiple choice questions would be used in this section wherever suitable. The questions would be designed to obtain data for evaluation purposes with specific reference to the manner in which information is obtained by respondents when starting a specific project and their personal involvement in such a task. A mutually exclusive multiple choice question would be employed to establish the frequency of use by respondents of their organisational library. Respondents would be questioned on how they keep up to date with developments in their field in respect of hours per week devoted to this task and the resources they use in doing so. In the latter question an open ended option of 'other - please give details' would be included with the range of options listed.

In the third part, designed for the non-users, information would be sought to identify the dependent variables of 'awareness of computerised searching' and 'the previous experience of non-users, if any, of computerised searching of databases'. A question on their attitude to computerised searching would be designed to identify reasons, if any, for non use and the final set of questions would solicit information on their awareness of IML, their source of such awareness and their attitude to computerised search services provided by IML.

In the third part, designed for the user survey, the questions would elicit information on satisfaction and deal with the reaction of the user to the

results of the search to which the questionnaire was attached. Six questions would obtain information on the amount of relevant material supplied by the search, the importance attached to the various bibliographic items in the citations supplied, the coverage of the references in relation to the field for which the search was designed, the availability of material on that field, the appearance of the citation in the printout and the number of useful citations estimated by the respondent as missing.

Two further questions would seek information as to the respondent's opinion of the arrangement of the items within the citations on the bibliographic list provided, and as to whether, on reflection, other keywords could have been used by the respondent. Two questions would elicit information on the timeliness of the search. A further question would solicit opinion on the attitude of the staff of IML, should the respondent have had any contact with them. Respondents would be asked to state their satisfaction or otherwise with the results of the search using a three point rating scale and a similar scale would be used to obtain comments on the charges levied by IML. The final question would be designed to obtain information on the manner in which the respondent contacted IML and whether any assistance had been obtained in formulating the search request.

5.5 The Production of the Questionnaire

The questionnaires intended for the user would be printed on white paper using an offset lithographic process and would be numbered in a series starting with 2001. The non-user form would be printed on yellow paper and numbered in a series starting with 1001.

The form for the user community would be produced in both official languages so that respondents could complete it in the language of their choice. It is felt that this could be a factor in avoiding respondent antagonism to the questionnaire. The non-user form will be produced in the English language only, this being the language of converse of the University of Cape Town.

Coding blocks would be on the form but would be separated from the answer blocks by a line to deter respondents from using them to reply. It is anticipated that the respondents would have different marking styles when completing the form and as this could give rise to problems in keyboarding the information, the researcher has decided to code the responses personally rather than use a method by which the respondents code the answers themselves when answering questions.

5.6 Pretesting the Questionnaire

The importance of pretesting the questionnaire is stressed by many writers on the subject who are unanimous in their belief that this will reveal ambiguity and bias in the most carefully constructed questionnaire (BERDIE & ANDERSON, 1974:47; LINE, 1982:58; BABBIE, 1973:206-7). The questionnaire was scrutinized by colleagues and statisticians in the Institute of Biostatistics of the MRC whose comments upon the phraseology of questions, and the meaning and likely responses to the multiple choice questions, were considered and included where appropriate. Only when this process had been completed was the questionnaire prepared for the pilot study.

5.7 The Pilot Study

All authorities on surveys draw attention to the importance of conducting a pilot survey before proceeding with the complete survey. The pilot survey should be carried out using a representative sample of the population to be studied (BABBIE, 1973:211; ROWLEY & TURNER, 1978:61; BERDIE & ANDERSON, 1974:47). The importance of using the questionnaire in its intended form for the pilot survey, so that all the questions fashioned after the pretesting phase are tested by respondents, is considered a major point of the pilot survey by some authorities (BABBIE, 1973:212; LINE, 1982:77).

Accordingly a sample of both populations was selected on the basis of advice from the Institute of Biostatistics of the MRC, with 5% of the estimated final number of respondents, amounting to 10 in each group, being surveyed. The sample of users was selected from the first 10 users who requested IML to conduct searches for them subsequent to the questionnaire being pretested. The sample of non-users was drawn from those identified as non-users and they were contacted personally by the researcher to obtain their cooperation before being sent the questionnaire. All respondents were asked to complete the questionnaire, to indicate any problems with ambiguity of the questions, and to comment if they considered the time required to complete the form unduly long. The respondents in both categories of the pilot survey were excluded from the final survey.

The results of the pilot survey revealed that the questions appeared to be understood by the respondents as their replies were not confusing to code. No comments were received on the length of the questionnaire and the one

completion time reported for the non-user survey was 5 minutes. Coding time for each form was slightly under 3 minutes.

5.8 Survey Response Rates

In a previous section (cf 4.4.2) the danger of a low response rate to a self administered questionnaire was discussed. In the literature survey conducted for this study the researcher located material dealing with response rates to such questionnaires by users of online services but was unable to locate material dealing with response rates by a non-user community where the self administered questionnaire method was used.

Moser (1972:268) in discussing response rates in the field of social surveys by self administered questionnaires indicates that a response rate of above 30 percent was needed to ensure reasonable results of value. Similar studies with users of online services show response rates of 65%, 63%, 51%, 60%, 38% and 30% (MARKEE, 1981:444; TAGLIACOZZA, 1973:171; TEITELBAUM, 1982:298; WARDEN, 1978:460; WARDEN, 1981:144).

All of the studies reported above were conducted on populations which had a direct organisational link with the supplier of the online service. No studies were located by the researcher where the users of online services were as geographically dispersed as in the present study and had no organisational links with the information service.

5.9 Conducting the Survey

5.9.1 The Non-User Sample

The reasons for using a cluster sample for this population have been discussed earlier (cf 5.2.4) and the selection of the cluster was based upon the following reasons. The three clusters available were identified as the Medical Faculties of the Universities of Natal, Stellenbosch and Cape Town. During the course of the study IML was conducting a promotional campaign within the Medical Faculty of the University of Stellenbosch and the researcher considered that bias could be introduced as a result of this in any responses obtained from this source. The geographical location of the University of Natal in relation to IML presented practical difficulties in following up non-responses. Because of these factors the Medical Faculty of the University of Cape Town was selected as the cluster for the sample. The list of the non-users was prepared by comparing the professional staff of the faculty as shown in the 1983 prospectus with the user records of IML just prior to the date upon which the questionnaire was distributed, and selecting those identified as non-users.

The questionnaire was supplied to the Dean of the Faculty of Medicine and permission was obtained from him to conduct the survey. Acting on the advice of the Institute of Biostatistics of the MRC it was decided to attempt to obtain data from all those identified as non-users rather than draw a sample from the cluster so as to obtain as large a sample as possible.

The School of Librarianship provided a letter to accompany the questionnaire to the non-user group to explain the purpose of the survey and a return envelope stamped INTERNAL MAIL and addressed to the School of Librarianship was also provided. The entire package was addressed individually to the faculty members concerned. Initially 529 questionnaires were sent out and after 4 weeks, 208 had been returned, giving an initial response rate of 36.1%. A reminder letter was sent out and after a period of 4 weeks a further 72 replies were received. It was decided to close the survey at this point. The responses showed that 16 of the population had left the faculty since the prospectus had been prepared and that 48 of the respondents had used the services of IML although not recorded as users by IML (cf 5.1.2). This adjusted the cluster population to 465. This gave a response rate of 46.4%. Of the responses 16 were so incomplete as to be unusable and therefore the usable response rate was 43.6%.

5.9.2 The User Sample

The reasons for selecting a consecutive cluster sampling method for the survey of the user group have been discussed earlier (cf 5.2.4). The survey was started on 1st February 1983 and concluded on 29th June 1983, no questionnaires being sent out after this date. A user who requested more than one search during this period was excluded from the survey for the second and subsequent searches. A list of unique numbers was prepared for the user group and as each user's search result was sent back a questionnaire, a covering letter and a stamped, addressed envelope were enclosed with it. The returns were recorded daily and if no response had been received after four weeks, a reminder letter was sent to the user. The return register was closed on 19th August 1983.

A total of 261 users were identified during the period of the survey and 209 replies were received, giving a response rate of 80%. This compares favourably with the response rates recorded in similar studies as discussed earlier and is well above the minimum limit discussed previously (cf 5.8).

5.9.3 The non-respondent non-users survey

The dangers of a low response rate in surveys and the possibility of the introduction of bias into the data collected, by reason of the characteristics of respondents, have been discussed earlier (cf 4.4.2). Moser (1972:167), in dealing with social surveys, considers that the non-respondents cannot be ignored as experience has shown that they may differ from the respondents and thus constitute a subset within the population. The researcher decided therefore, in view of the relatively low response rate, that an attempt should be made to sample the non-respondents. There were 249 non-respondents and a 10% sample of 25 was drawn from the list of non-respondent non-users. The selection was done by using a table of random numbers to identify the unique number allocated to each non-user when the original list was prepared (cf 5.9.1). In this procedure if the unique number identified by the selection method was found to be that of a respondent, then the next random number was used. Selection was continued until 25 non-respondents had been identified.

The researcher contacted each non-respondent by telephone in an effort to obtain cooperation in completing and returning the questionnaire. Of the 25 in the sample it was discovered that 3 had left the faculty, 6 declined to complete the questionnaire because of pressure of work, 4 identified

themselves as users and 12 agreed to consider completing the questionnaire. Ten completed questionnaires were returned and two were returned blank. Thus a 48% return rate was achieved with a usable response rate of 40%.

CHAPTER 6

ANALYSIS OF THE EMPIRICAL STUDY DATA

6.1 Introduction

The responses in each questionnaire were coded by the researcher for entry into the IBM 4341 computer operated by the Institute for Biostatistics of the MRC. In the coding it was discovered the user group responses included 33 undergraduate students who had responded to the questionnaire. As the non-user group had been selected from members of the Faculty of Medicine and thus contained no students it was decided, therefore, to omit the students from the user group in the comparisons made between the user and non-user group in order to avoid any bias. The student responses were included in the analysis of the data dealing with user satisfaction.

Two way tables were analysed using the FREQ procedure in the Statistical Analysis System (SAS) package (SAS USERS GUIDE, 1982:513-26). The FREQ procedure provides estimates of measures of association using the chi-square test. Three way tables were analysed using the 4F programme of the Biomedical Data Processing Package (BMDP4F) to provide estimates of associations using the chi-square test with three sets of variables in order to check if the two way associations found to be significant between users and non-users were only due to these factors. The variables of non-user or user were analysed against age rank, work activity and a series of information behaviour variables. For the purposes of this study a statistical significance level of 5% was selected for all analyses, thus a value of P less than 0.05 was required from the

chi-square test. The probability is shown in all cases where such tests were valid. In the three way analysis tables of data were only generated if the probability was less than $P=0.05$. Certain questions such as those seeking data on qualifications, organisational or departmental affiliation or of the open ended type resulted in data which could not be analysed statistically. This was due to either a very low number of responses or the data having a meaningless pattern.

Not all respondents answered each question and thus the total number of responses is not constant throughout the analysis. The percentage analysis of each question is based upon the number of responses to that question, non-responses not being included in the analysis.

PART A: The analysis of use and non-use according to the independent variables of age, rank and work activity

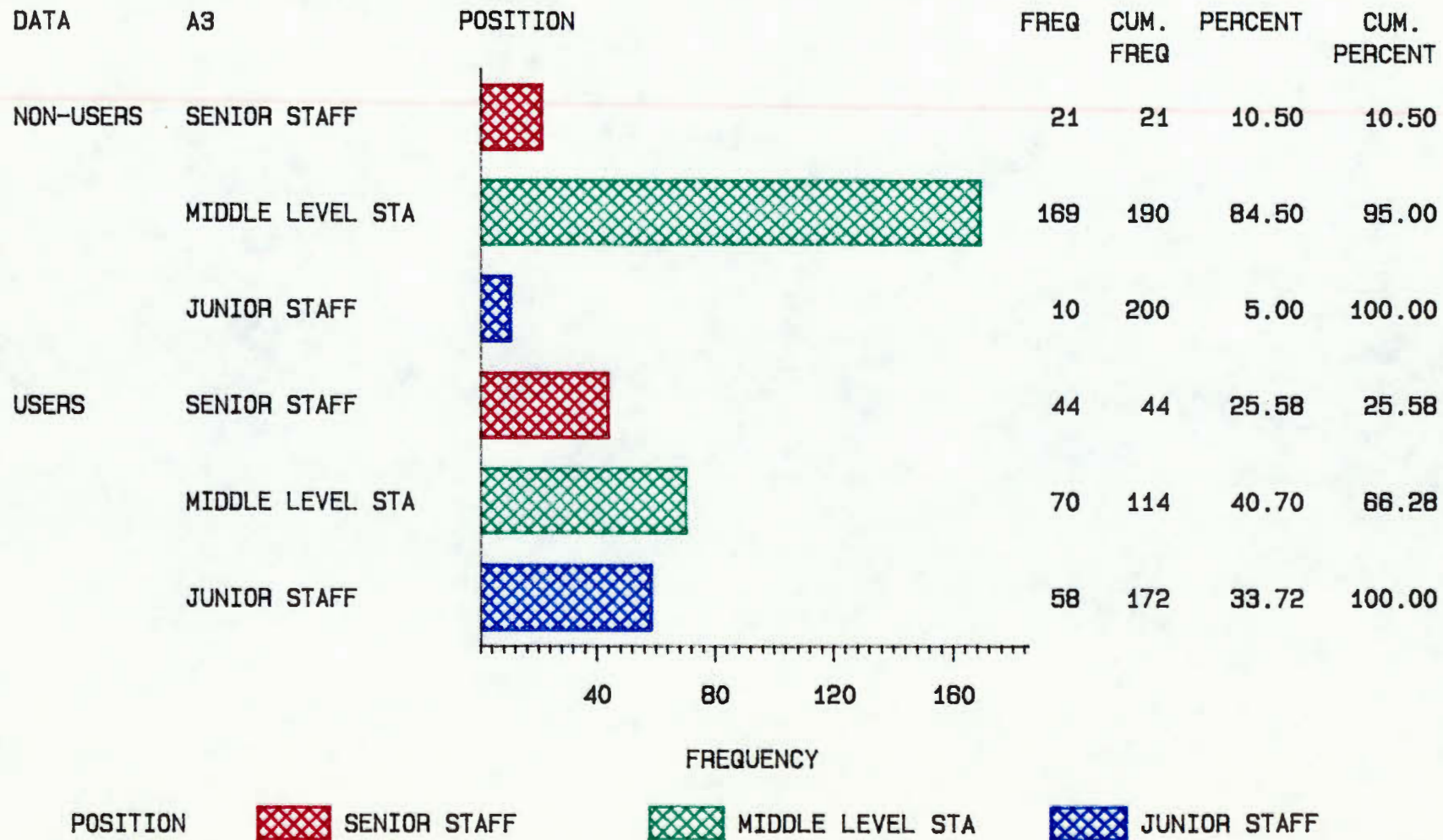
For the purpose of analysis of this part two way tables were produced using the FREQ procedure (cf. 6.1)

6.2 Comparison of non-users and users according to level of position

Question: Part A, No 3; Table 2

The respondents in both groups were grouped according to the position they held as indicated by them on the questionnaire. As the respondents in the user group held positions with a variety of titles a schedule was prepared to equate positions between organisations, so that all respondents could be grouped into one of three rank strata. The senior ranks were professors,

TABLE 2 : COMPARISON OF NON-USERS AND USERS
ACCORDING TO LEVEL OF POSITION



assistant professors, directors and senior staff of hospitals. Middle rank staff were considered to be senior lecturers, senior research officers and senior consultants. Respondents with positions below these levels comprised the third stratum. A significant difference ($P=0.0001$) between the user and non-user group was detected in the rank distribution when the chi-square test was applied. In the user group the senior staff and junior staff constituted a higher percentage in the sample (26% and 34% respectively) than the corresponding non-user groups (11% and 5% respectively). The middle level staff in the non-user group comprised 85% as against 41% for the user group.

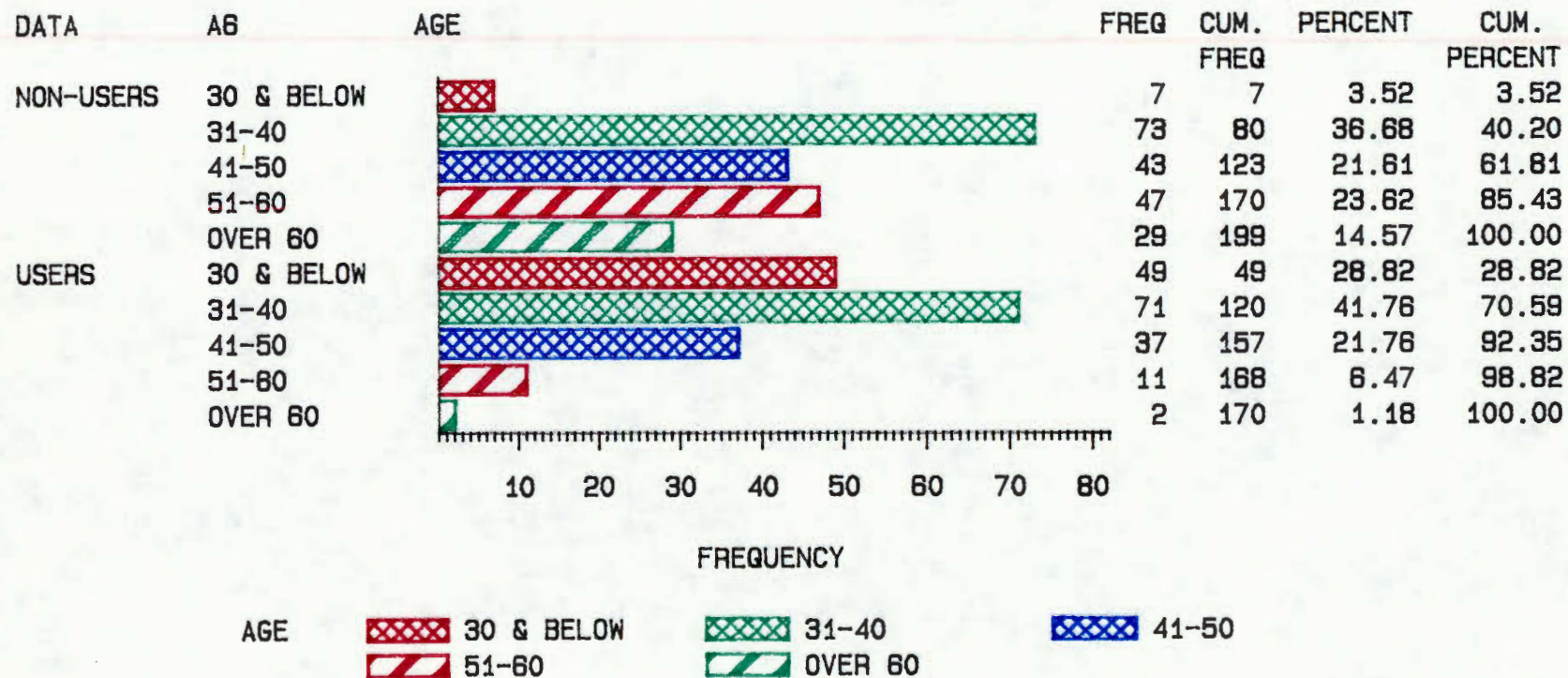
6.3 Comparison of non-users and users according to age Question: Part A, No 6; Table 3

Using the chi-square test there were significant differences between the age groups with a greater proportion of users in the younger age groups when compared with the non-users ($P=0.0001$). Of the users, 29% were below the age of 30 compared with 4% of the non-users. The relationship is reversed in the higher age groups with 38% of the non-user group being over 50 and only 8% of the users being over 50 years old.

6.4 Comparison of non-users and users according to work type Question: Part A, No 7.1-7.6; Tables 4-7 & 50 Appendix A

A significant difference ($P=0.0001$) was measured between the two groups in the time devoted to dealing with patients. In the non-user group 56% of the

TABLE 3 : COMPARISON OF NON-USERS AND USERS
ACCORDING TO AGE



respondents had a heavy or very heavy commitment to patient care whilst in the user group only 35% of the respondents had a similar commitment to patient care.

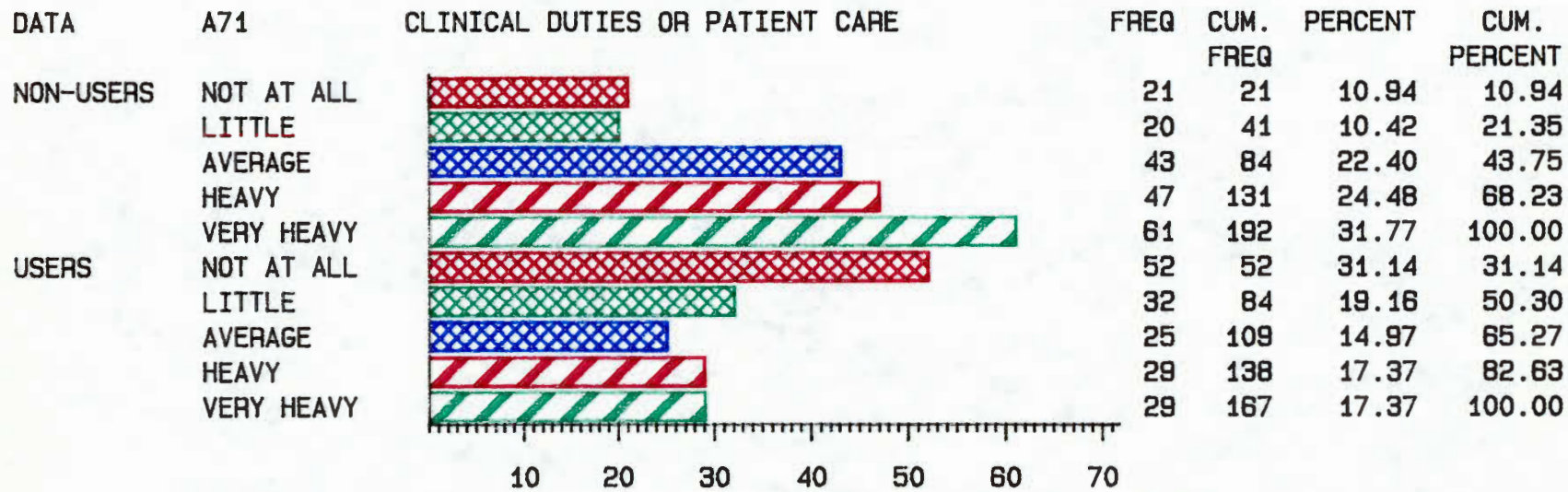
The respondents were asked to indicate their involvement in research work on a semantic differential scale and when the chi-square test was applied a significant difference could be shown between the two groups ($P=0.0001$). Users were more heavily occupied with research, 47% having a heavy or very heavy research commitment as against 13% of the non-users in the same category. Of the non-users, 67% did little or no research whilst only 17% of the users conducted little or no research.

Respondents were asked to indicate their involvement in studying according to a semantic differential scale. A significant difference ($P=0.0001$) was found between groups when the chi-square test was applied to the data. The users spent more time studying as 48% were heavily or very heavily involved in studying. In the non-user group the figures for the same rankings were 17%. Of the non-users, 31% spent little or no time in studying as compared to 14% of the users.

No significant difference could be detected between the two groups as to the time devoted to administration. The majority of both groups indicated that they spent an average or less than average amount of time on administration.

The respondents were asked to indicate, according to a semantic differential scale, the time they spent in teaching. A significant difference was measured ($P=0.0002$) between non-users and users for this variable. The non-users had a heavier teaching commitment than the users, only 28% spending little or no











TABLE 4 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO WORK TYPE :
 PATIENT CARE DUTIES



LEGEND: A71

 NOT AT ALL	 LITTLE	 AVERAGE
 HEAVY	 VERY HEAVY	

TABLE 5 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO WORK TYPE :
 RESEARCH COMMITMENT

DATA	A72	RESEARCH	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
NON-USERS	NOT AT ALL		45	45	23.68	23.68
	LITTLE		82	127	43.16	66.84
	AVERAGE		38	165	20.00	86.84
	HEAVY		17	182	8.95	95.79
	VERY HEAVY		8	190	4.21	100.00
USERS	NOT AT ALL		5	5	2.96	2.96
	LITTLE		24	29	14.20	17.16
	AVERAGE		61	90	36.09	53.25
	HEAVY		41	131	24.26	77.51
	VERY HEAVY		38	169	22.49	100.00

FREQUENCY

RESEARCH  NOT AT ALL  LITTLE  AVERAGE
 HEAVY  VERY HEAVY

TABLE 6 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO WORK TYPE :
 TIME SPENT STUDYING

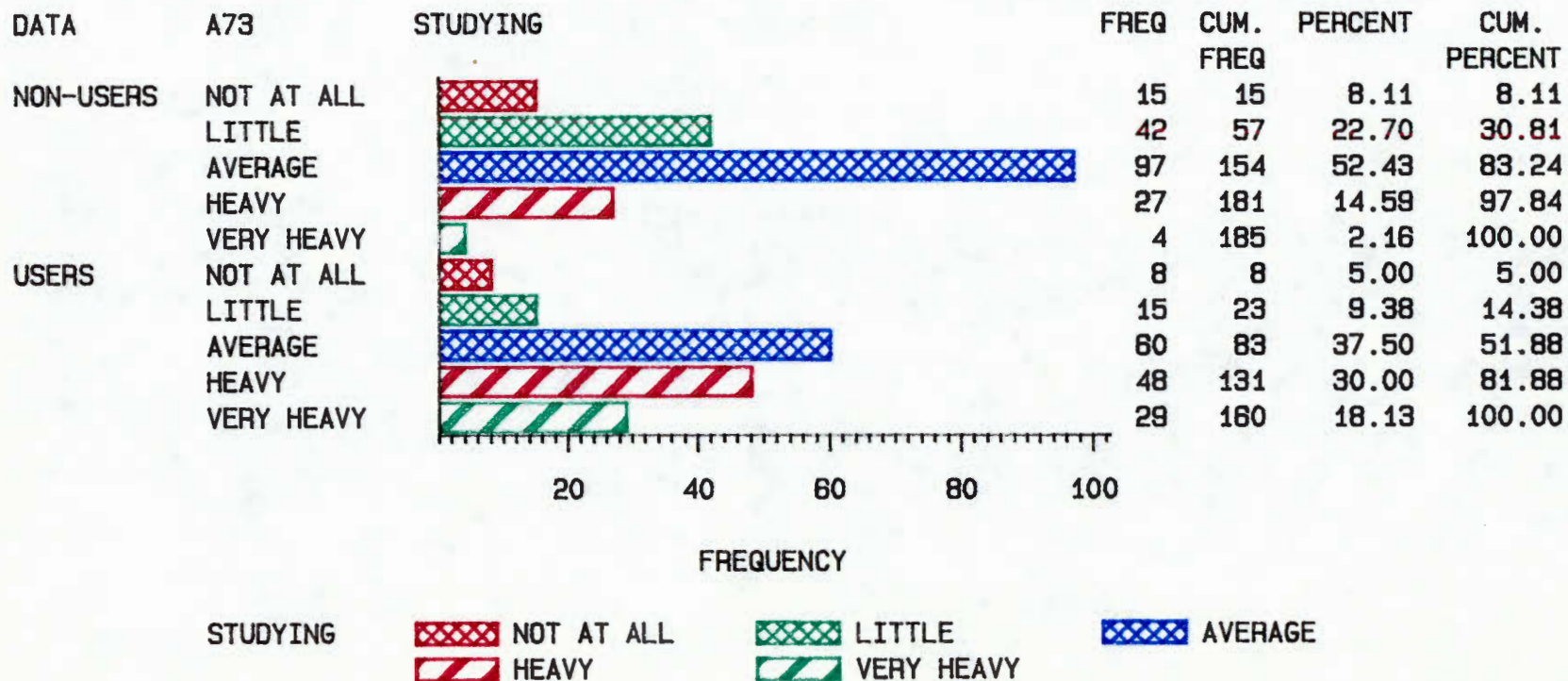
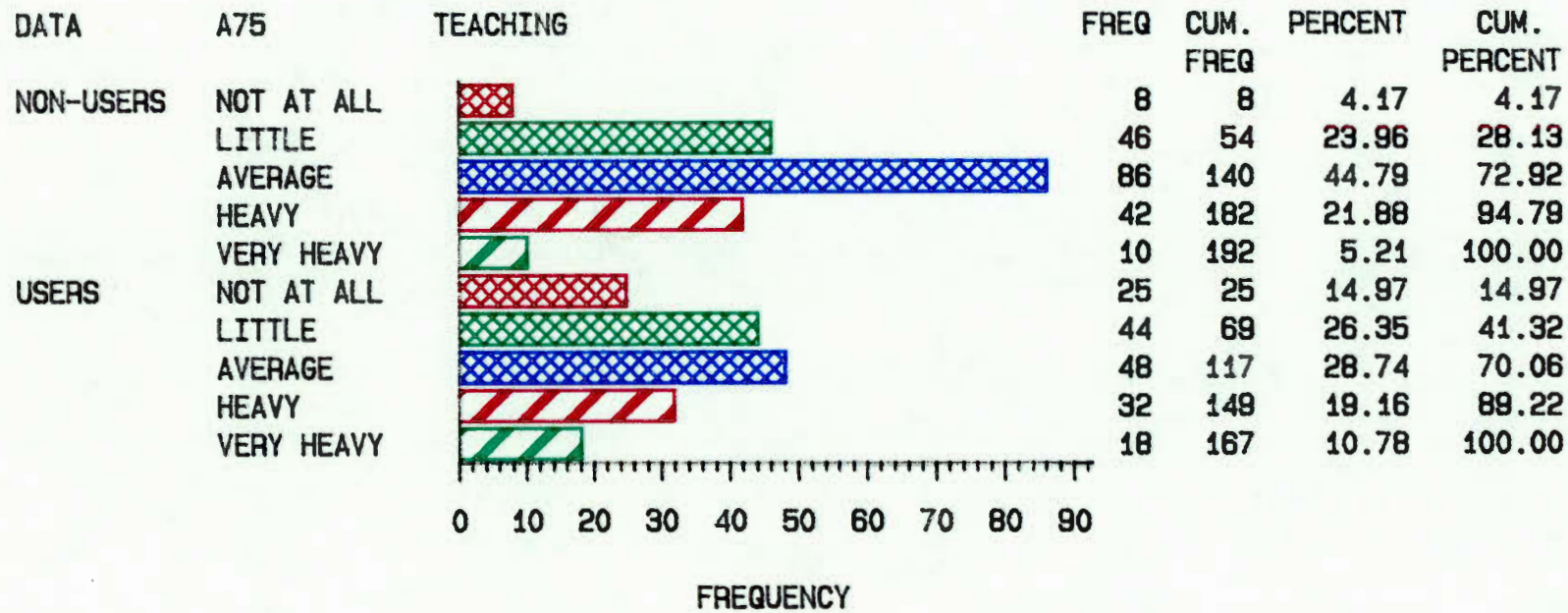


TABLE 7 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO WORK TYPE :
 TEACHING



TEACHING

 NOT AT ALL	 LITTLE	 AVERAGE
 HEAVY	 VERY HEAVY	

time teaching as compared to 41% of the users with the same commitment. The non-users who had an average teaching commitment made up 45% of the sample, compared to only 29% of the users.

Although the researcher considered the main work activities of respondents had been identified, a column for 'other' duties was included to check this and also to identify possible activities of significance which may have been overlooked.

The responses confirmed that all the main work activities had been identified. Twenty-two non-users and 21 users indicated that they had 'other' duties. Where the respondents elaborated upon the reply, the range of activities was quite large featuring such activities as laboratory work, forensic duties, editorial duties, maintenance of equipment, and consultations.

PART B: The analysis of use and non-use according to information seeking behaviour

The data in this part was analysed by the FREQ procedure to produce two way tables and levels of association. To check as to whether the significant associations found in the two way analysis were due to the variables used, a three way analysis was also done on the data to include the variables of age, rank and work activity using the BMDP4F package. The significant associations produced in a three way analysis for variables other than use and non-use were very few and so isolated as to form no discernable pattern. Two way analysis also produced by the MBDP4F package confirmed the significance of the two way associations produced by the FREQ analysis. The data for the three way analysis is not included in this report.

6.5 Comparison of non-users and users according to method of location of references Question: Part B, No 1.1-1.7; Tables 8-11 & 51 Appendix A

The respondents were asked to indicate on a semantic differential scale the frequency with which they consulted their colleagues when seeking reference material on a new project. There was a significant difference ($P=0.0233$) measured between the users and non-users. Non-users who considered they frequently consulted their colleagues made up 50% of the total, compared to 35% of the users. Of the users, 45% consulted their colleagues only occasionally compared to 36% of the non-users. The non-users thus appear to use their colleagues as a source of information more than do the users.

No statistically significant difference could be measured between the groups in the use of their organisational library to locate references. The majority of both groups obviously considered the library an important source of references as they used the library frequently or very frequently when locating references.

A significant difference ($P=0.0077$) was measured between the two groups in their use of a private or departmental library in the location of reference material. Non-users used such sources more often than users, 17% using the source very frequently, compared to 10% of the users with a similar rating. The users showed higher percentages for the less frequent usage ratings than the non-users. The private or departmental library seems to be used more by non-users than users in locating reference material.

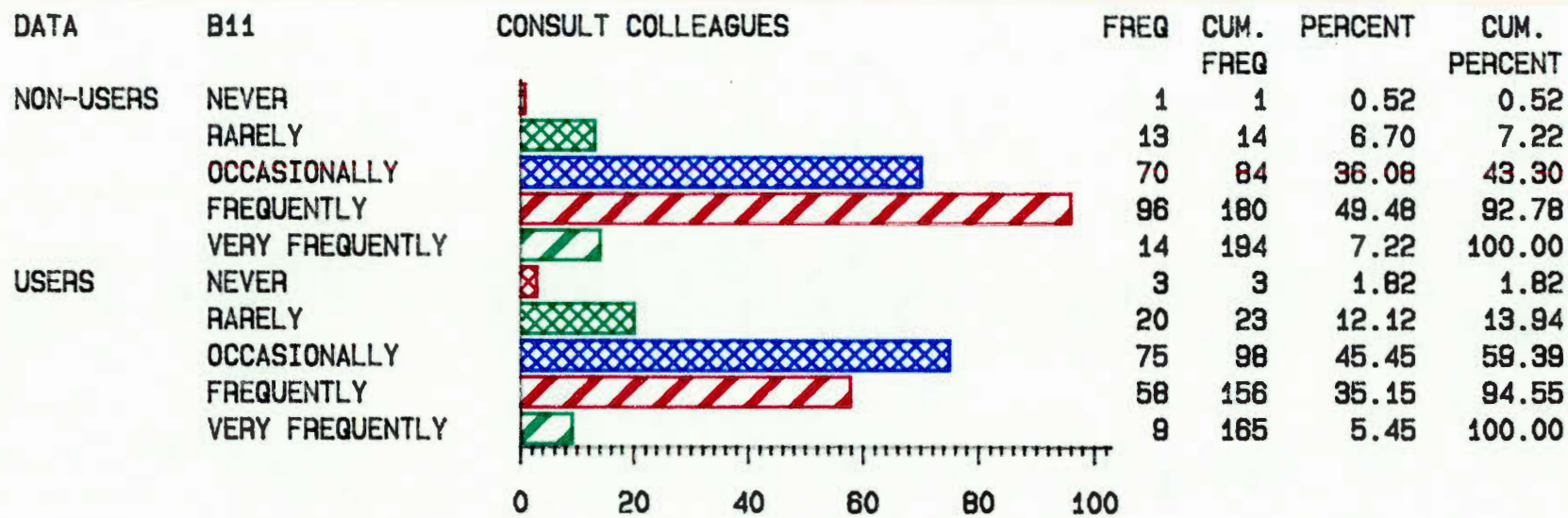
A significant difference ($P=0.0001$) was measured between the groups in their usage of libraries outside their organisation. In the users category 10% never used such facilities and 26% rarely used them; however, 28% frequently made use of them. Among the non-users 29% never used them and 39% rarely used them, whilst only 4% used them frequently. The user group therefore seems to use outside libraries more than does the non-user group as a source of reference material.

A significant difference ($P=0.0001$) was measured between the two groups in the use of computerised data bases to locate references. Of the non-users 75% said they had never used this method whilst only 11% of the users said they had never used this method. As the users were responding to a questionnaire accompanying the results of a computerized database search they had requested from IML, this response could indicate their use of the method prior to this search. In all other responses the user group showed a higher percentage response, with 32% using databases occasionally and 18% frequently, compared to 5% and 3% for the same ratings by the non-users. Therefore the user group depends on this method for the location of reference material more often than does the non-user.

No significant difference was measured between the groups in their use of company representatives as sources of reference material. Over 50% of both groups never used this source and 26% and 31% of the non-users and users respectively rarely used this method.

In order to confirm that the main methods of reference location had been identified an open-ended answer of 'other' was included in this question. In the non-user group 186 failed to respond to the question and 10 said they

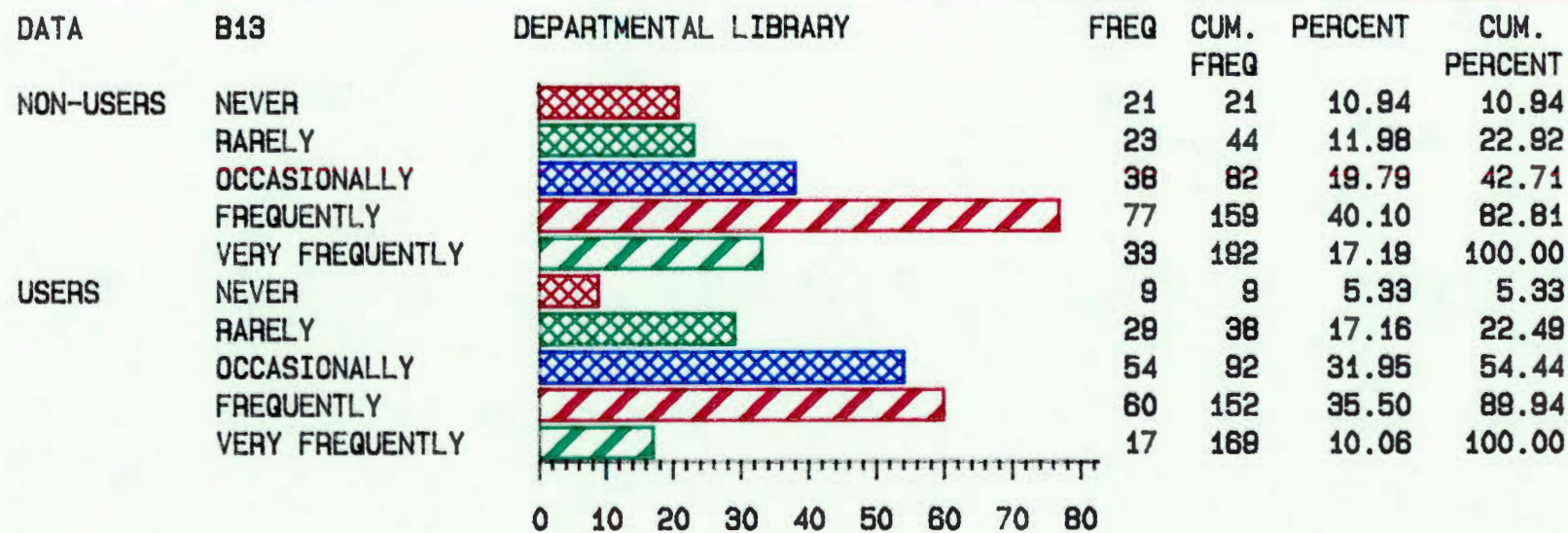
TABLE 8 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF LOCATION OF REFERENCES :
 COLLEAGUES



LEGEND: B11











	NEVER		RARELY		OCCASIONALLY
	FREQUENTLY		VERY FREQUENTLY		

TABLE 9 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF LOCATION OF REFERENCES :
 PRIVATE OR DEPARTMENTAL LIBRARY



LEGEND: B13 NEVER RARELY OCCASIONALLY
 FREQUENTLY VERY FREQUENTLY



TABLE 10 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF LOCATION OF REFERENCES :
 OUTSIDE LIBRARY

DATA	B14	USE OUTSIDE LIBRARY	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
NON-USERS	NEVER		55	55	29.41	29.41
	RARELY		73	128	39.04	68.45
	OCCASIONALLY		47	175	25.13	93.58
	FREQUENTLY		8	183	4.28	97.86
	VERY FREQUENTLY		4	187	2.14	100.00
USERS	NEVER		17	17	10.00	10.00
	RARELY		44	61	25.88	35.88
	OCCASIONALLY		51	112	30.00	65.88
	FREQUENTLY		48	160	28.24	94.12
	VERY FREQUENTLY		10	170	5.88	100.00

FREQUENCY

LEGEND: B14

 NEVER
 FREQUENTLY

 RARELY
 VERY FREQUENTLY


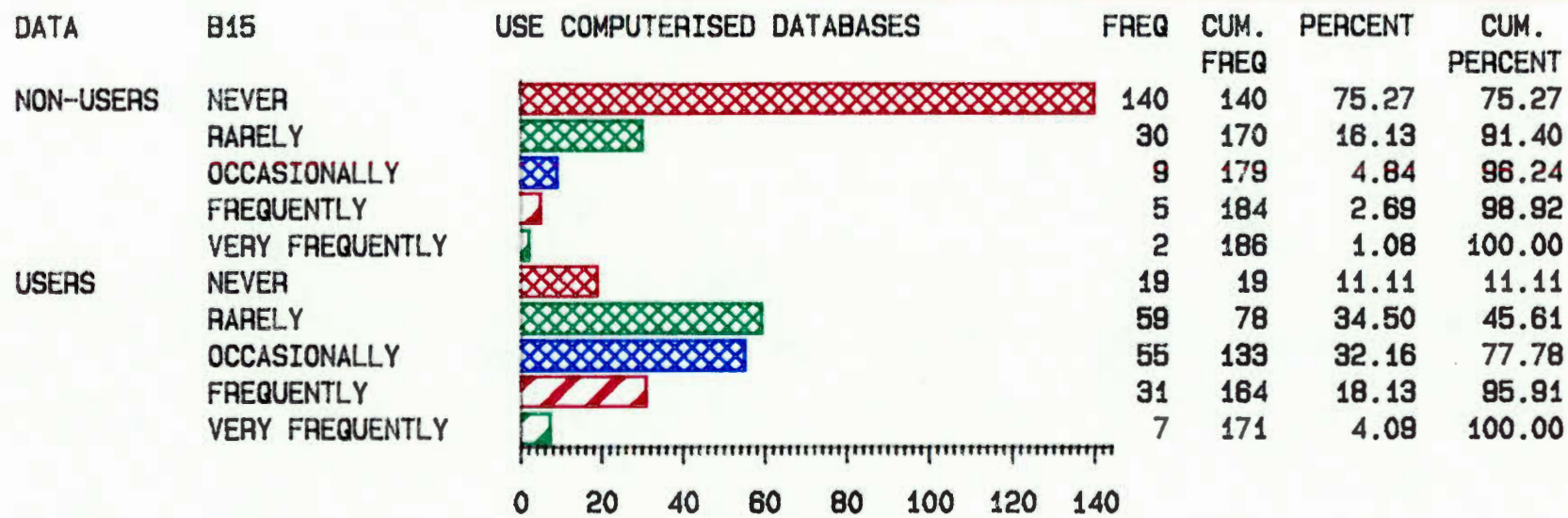
 OCCASIONALLY

TABLE 11 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF LOCATION OF REFERENCES :
 COMPUTERIZED DATABASES



LEGEND: B15

[Red cross-hatch] NEVER	[Green cross-hatch] RARELY	[Blue cross-hatch] OCCASIONALLY
[Red diagonal] FREQUENTLY	[Green diagonal] VERY FREQUENTLY	

never used other means. Thus only 4 respondents in this group used other methods. In the user group 155 failed to respond, 12 indicated they never used other means, and 4 used other methods. Those who used other means said they used tapes, books or departmental circulars.

6.6 Comparison of non-users and users according to literature searching style Question: Part B, No 2.1-2.5; Tables 12-14 & 52 Appendix A

In the data on whether respondents did their own literature searching significant difference could be measured between the groups and 90% of non-users, and 85% of users frequently or always do their own searching.

There was a significant difference ($P=0.0001$) between the two groups in their use of library staff to locate references for them. More of the user group relied on library staff to search for them with 14% frequently or always asking the library staff to do it for them compared with 3% of the non-user group. The percentage of the non-users rarely or never using the library staff to search on their behalf (33% and 50% respectively) was also higher than that of the user group (25% and 36% respectively).

There was a significant difference ($P=0.0009$) between non-users and users in their attitude to seeking assistance from the library staff. The non-users did not seek help as much as the users, as only 19% of them sought help frequently or always compared with 37% of the users.

Having an assistant do the literature search did not appear to be particularly favoured by any group, as 94% of the non-users rarely or never used this

TABLE 12 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO LITERATURE SEARCHING STYLE :
 ASK LIBRARIAN TO DO IT

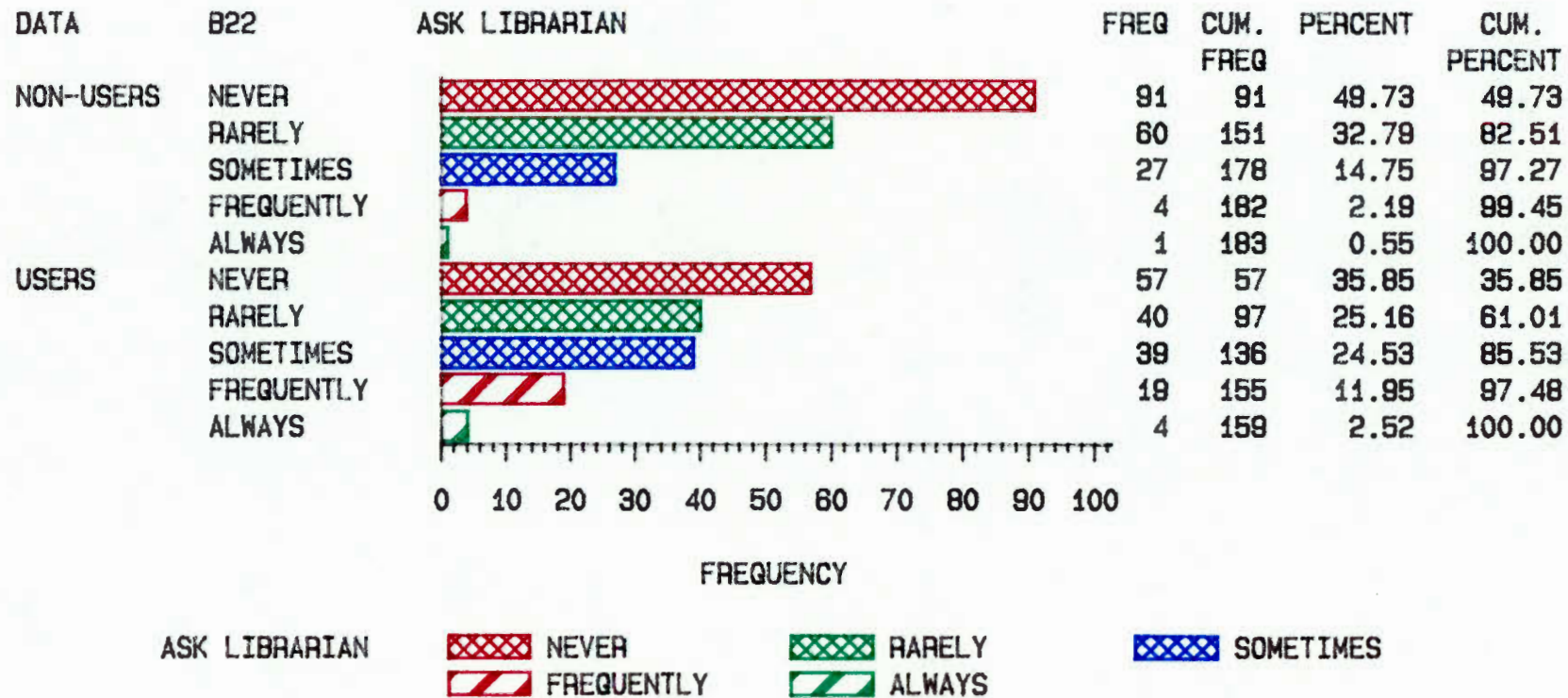
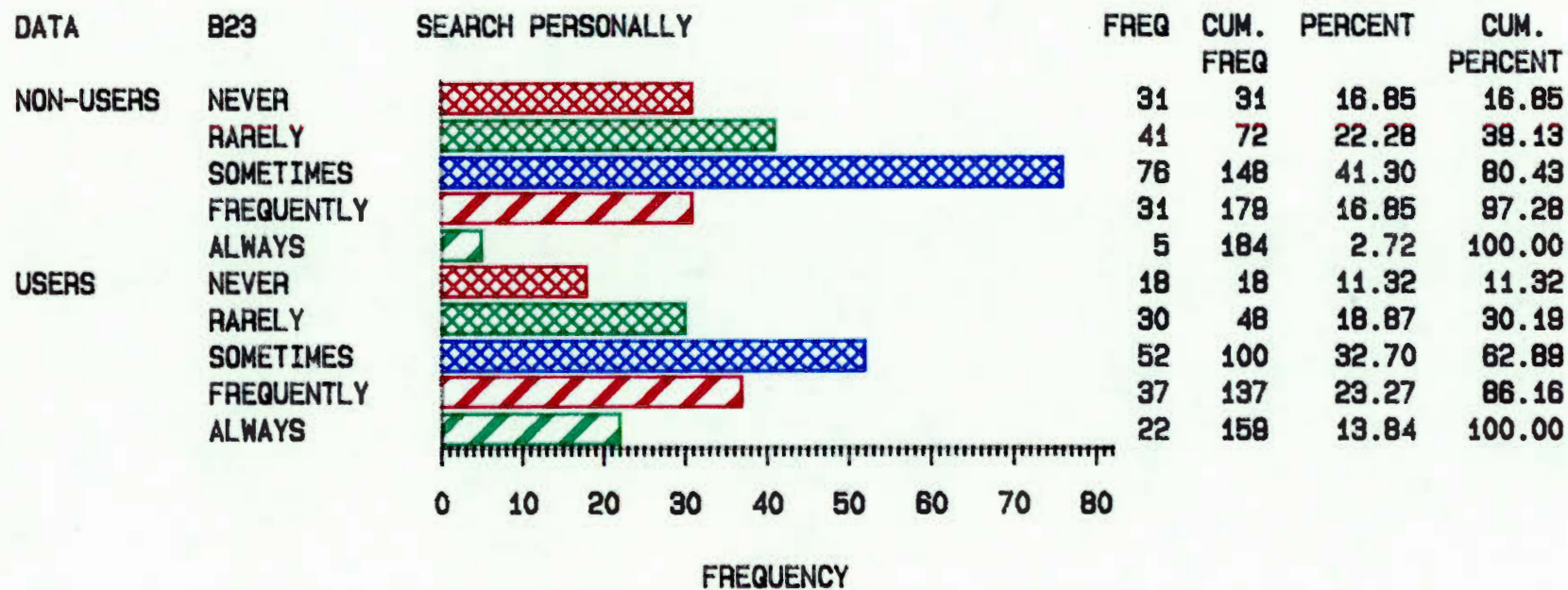


TABLE 13 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO LITERATURE SEARCHING STYLE :
 SEARCHING PERSONALLY AFTER ADVICE

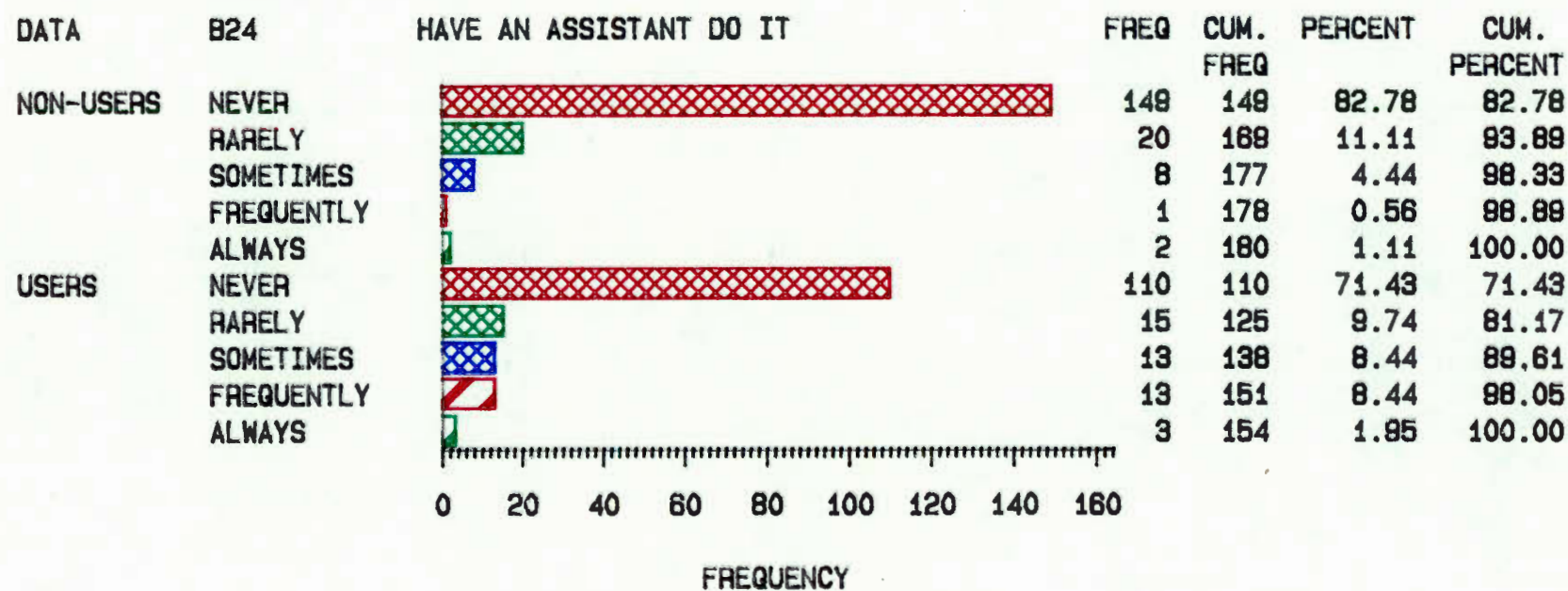


LEGEND: B23

NEVER
 RARELY
 SOMETIMES

FREQUENTLY
 ALWAYS

TABLE 14 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO LITERATURE SEARCHING STYLE :
 HAVE AN ASSISTANT TO DO THE SEARCH



LEGEND: B24

- NEVER
- RARELY
- SOMETIMES
- FREQUENTLY
- ALWAYS

approach compared to 81% of the users. Where this approach was used, however, there was a significant difference ($P=0.0029$) between the groups: the users used this method more than the non-users, 10% of them doing so frequently or always, compared to 2% of non-users.

The open-ended question added to this multiple choice question revealed that no responses of significance had been overlooked by the researcher, as only 4 non-users and 4 users completed it with replies showing methods other than those identified and listed by the researcher. Those who elaborated said they gave the task to students.

6.7 Comparison of non-users and users according to frequency of library use

Question: Part B, No 3; Table 15

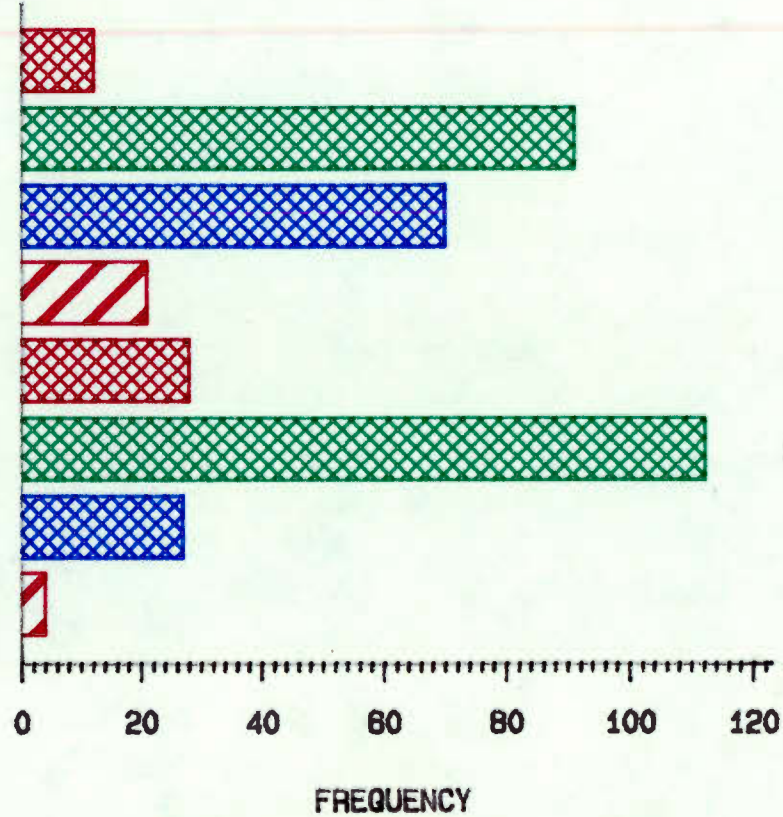
A significant difference ($P=0.0001$) was found between the two groups in the frequency of their use of their organisational library. The users made more use of the library, as 82% of them used it once a week or more compared to 53% of the non-users. Of the non-users 47% used the library only once a month or less compared to 18% of the users with the same use frequency.

6.8 Comparison of non-users and users according to time spent on keeping up to date Question: Part B, No 4

No significant difference could be measured between the groups in the amount of time they spent keeping up to date with developments in their field. Of the users 52%, and of the non-users 63%, spent between 1 and 5 hours each week keeping up to date.

TABLE 15 : COMPARISON OF NON-USERS AND USERS ACCORDING TO FREQUENCY OF LIBRARY USE

DATA	B3	FREQ OF LIBRARY USE	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
NON-USERS		ONCE A DAY+	12	12	6.18	6.18
		ONCE A WEEK+	91	103	48.91	53.09
		ONCE MONTH+	70	173	36.08	89.18
		ALMOST NEVER	21	194	10.82	100.00
USERS		ONCE A DAY+	28	28	16.37	16.37
		ONCE A WEEK+	112	140	65.50	81.87
		ONCE MONTH+	27	167	15.79	97.66
		ALMOST NEVER	4	171	2.34	100.00



LEGEND: B3

	ONCE A DAY+		ONCE A WEEK+
	ONCE MONTH+		ALMOST NEVER

6.9 Comparison of non-users and users according to method of current awareness Question: Part B, No 5.1-5.5; Tables 16-18 and 53 Appendix A

No significant difference could be measured between the groups in their use of journals as a means of keeping up to date with developments in their field. Of the non-users 97%, and of the users 95%, used this method.

A significant difference ($P=0.0004$) was measured between groups in the use of colleagues as a source of information. Of the non-users 87% used their colleagues, compared to 72% of users. This finding correlates with the findings reported in Table 8 where non-users were measured as using their colleagues as a source of reference material to a significantly greater extent than users.

A significant difference ($P=0.0077$) was measured between the groups in their use of secondary literature to keep up to date. Only 40% of non-users used this method compared to 54% of users. The majority of non-users did not favour the approach but a slight majority of users did favour it.

The responses from both groups showed that a computerised SDI service was not commonly used but nevertheless, a significant difference was measured ($P=0.0001$) between groups in its use. Only 3% of the non-users obtained information by this means compared to 18% of the users.

The response to the open-ended question in this section indicated that the researcher had identified the major methods used by respondents in keeping up

TABLE 16 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF CURRENT AWARENESS :
 DISCUSSION WITH COLLEAGUES

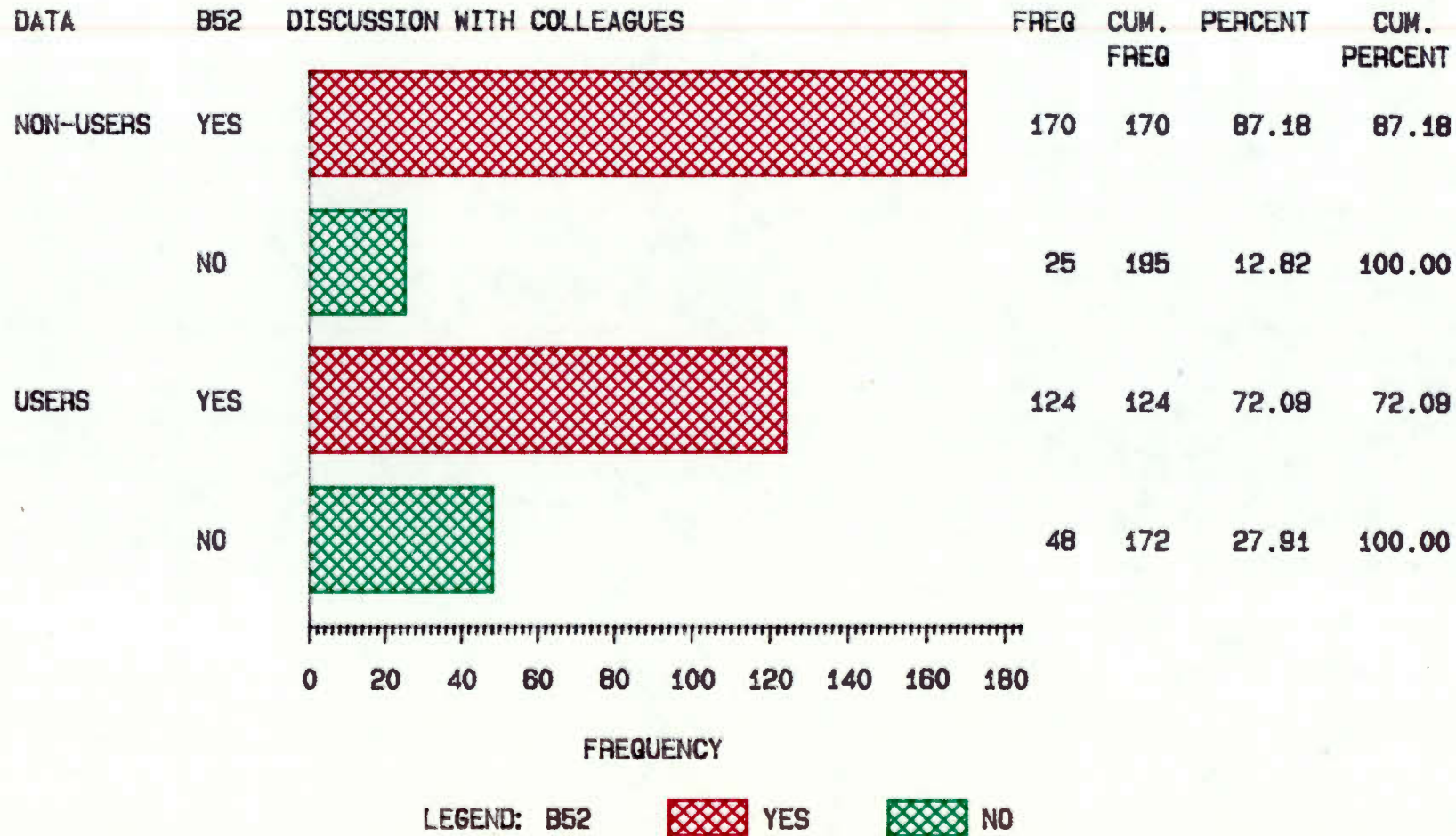


TABLE 17 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF CURRENT AWARENESS :
 USING INDEXES OR ABSTRACTING JOURNALS

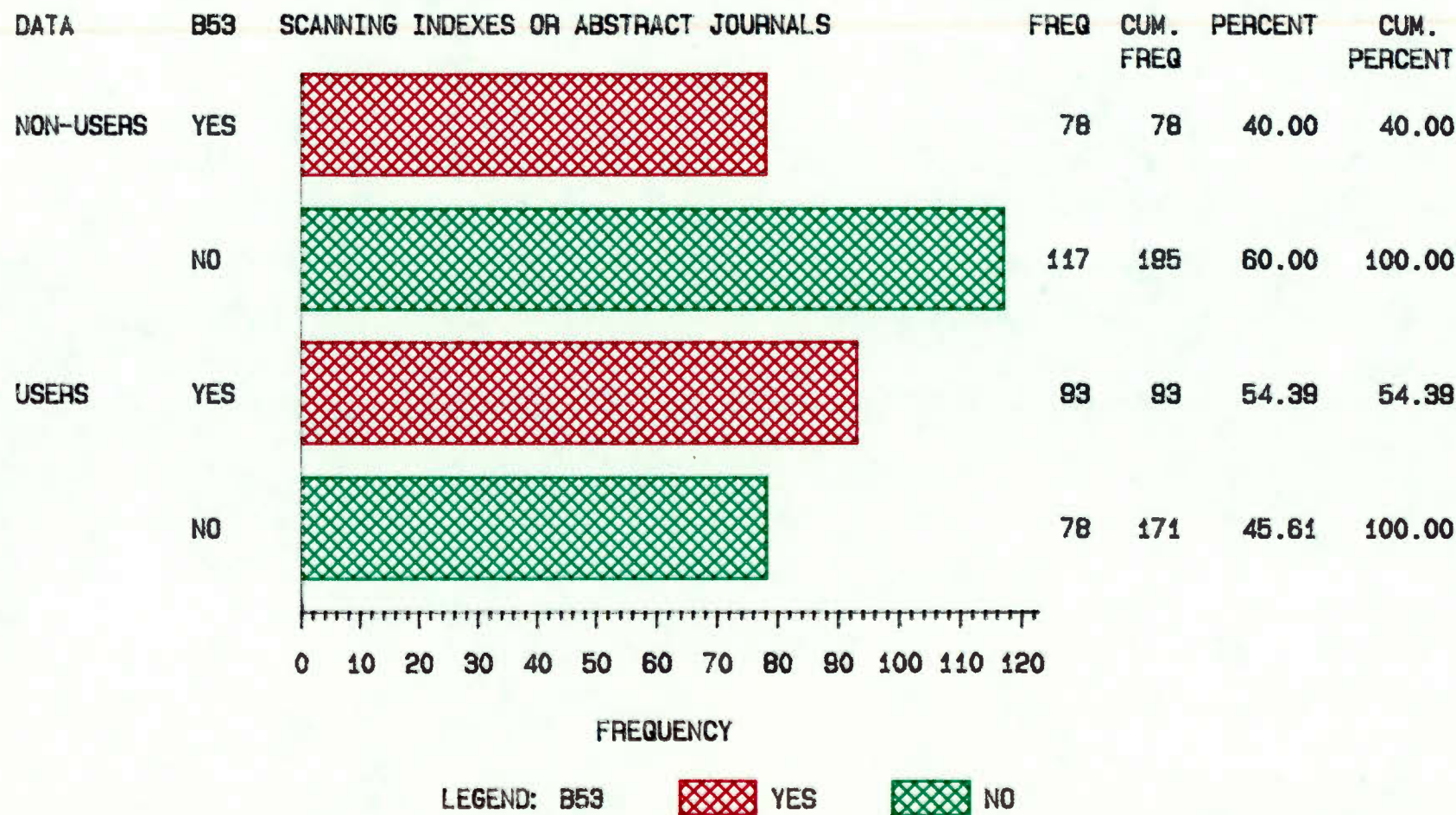
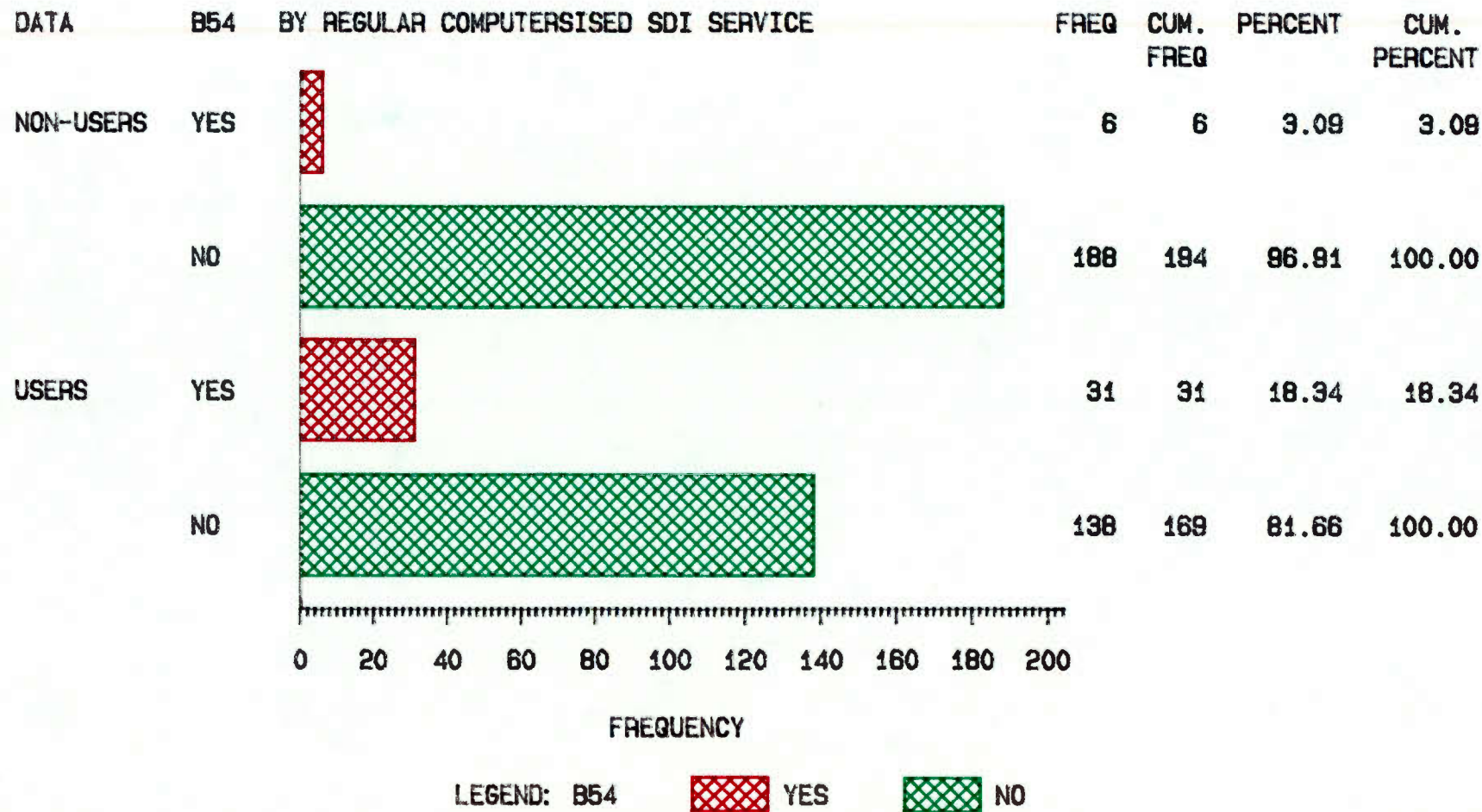


TABLE 18 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO METHOD OF CURRENT AWARENESS :
 BY A COMPUTERIZED SDI SERVICE



to date. Whilst 16% of non-users and 10% of users indicated they used means other than those listed, there was no significant difference between the groups. The principal other means listed were meetings, lectures, journal clubs and tapes.

6.10 Comparison of non-users and users according to source of references

Question: Part B, No 6.1-6.6; Tables 19-21 & 54 Appendix A

A significant difference ($P=0.0116$) was measured between the two groups in their use of journals as a source of reference material. Of the users, 60% used journals very frequently, compared to 50% of non-users. This finding differs from that reported in Cap 6.9 where no difference could be measured between the groups in their use of journals in keeping up to date. The difference in findings could be explained by the difference in purpose for which the journals are used. Journals are possibly used by both groups as a method of current awareness but whether they are used as a source of reference material could depend on the work activity of the person involved. The user group has been shown to be more research orientated (cf Table 5) and thus they may make more use of this source to obtain references.

In the use of the exchange of reprints no significant difference was measured between the two groups, 71% of non-users and 68% of users rarely using this method. This method was used frequently by 26% of non-users and 28% of users.

A significant difference was measured between the two groups in the use of textbooks as a source of reference material. The non-user group favoured this method more than the users, 21% of them using it frequently compared to 10% of the users in the same category.

No significant difference was measured between the two groups in their use of conference proceedings to locate reference material. This method was frequently used by 26% of non-users and 34% of users.

A significant difference ($P=0.0045$) was measured between the two groups in their use of the secondary literature as a source of references. It was used very frequently by 21% of the users compared with 9% of the non-users in the same category of usage. This confirms the usage reported in Table 17, which shows that users favoured this source of material more than non-users in keeping up to date.

Only 5 non-users and 9 users indicated they used other methods, and this level of response indicated that the researcher had identified the principle methods of obtaining references. The principle 'other' method of locating references was departmental literature.

6.11 Comparison of non-users and users according to availability of departmental reference collection Question: Part B, No 8

No significant difference was measured between the groups in their access to group or departmental reference collections. Of the non-users, 65% and of the users, 63% had access to such collections.

TABLE 19 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO SOURCE OF REFERENCES :
 JOURNALS

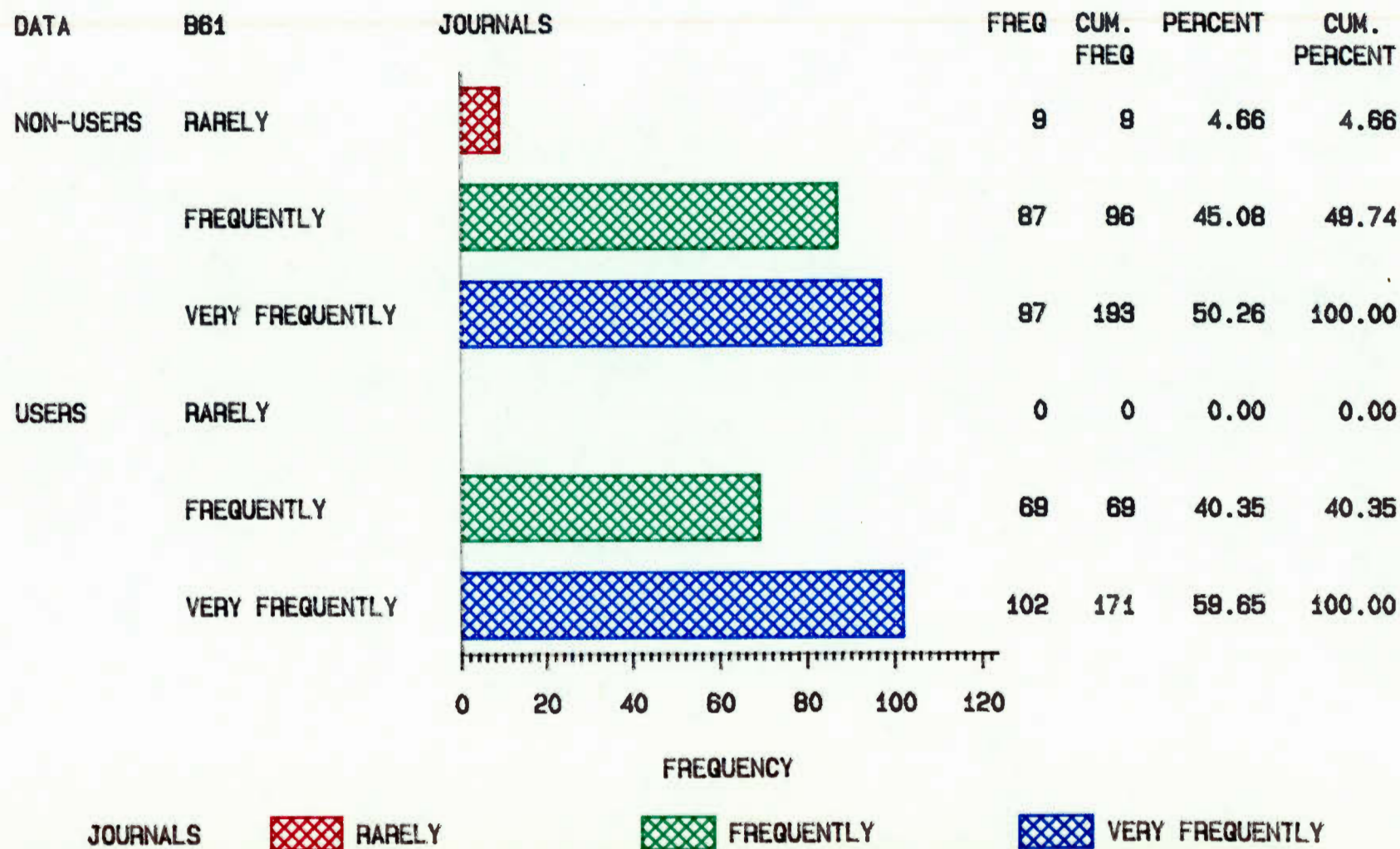


TABLE 20 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO SOURCE OF REFERENCES :
 TEXTBOOKS

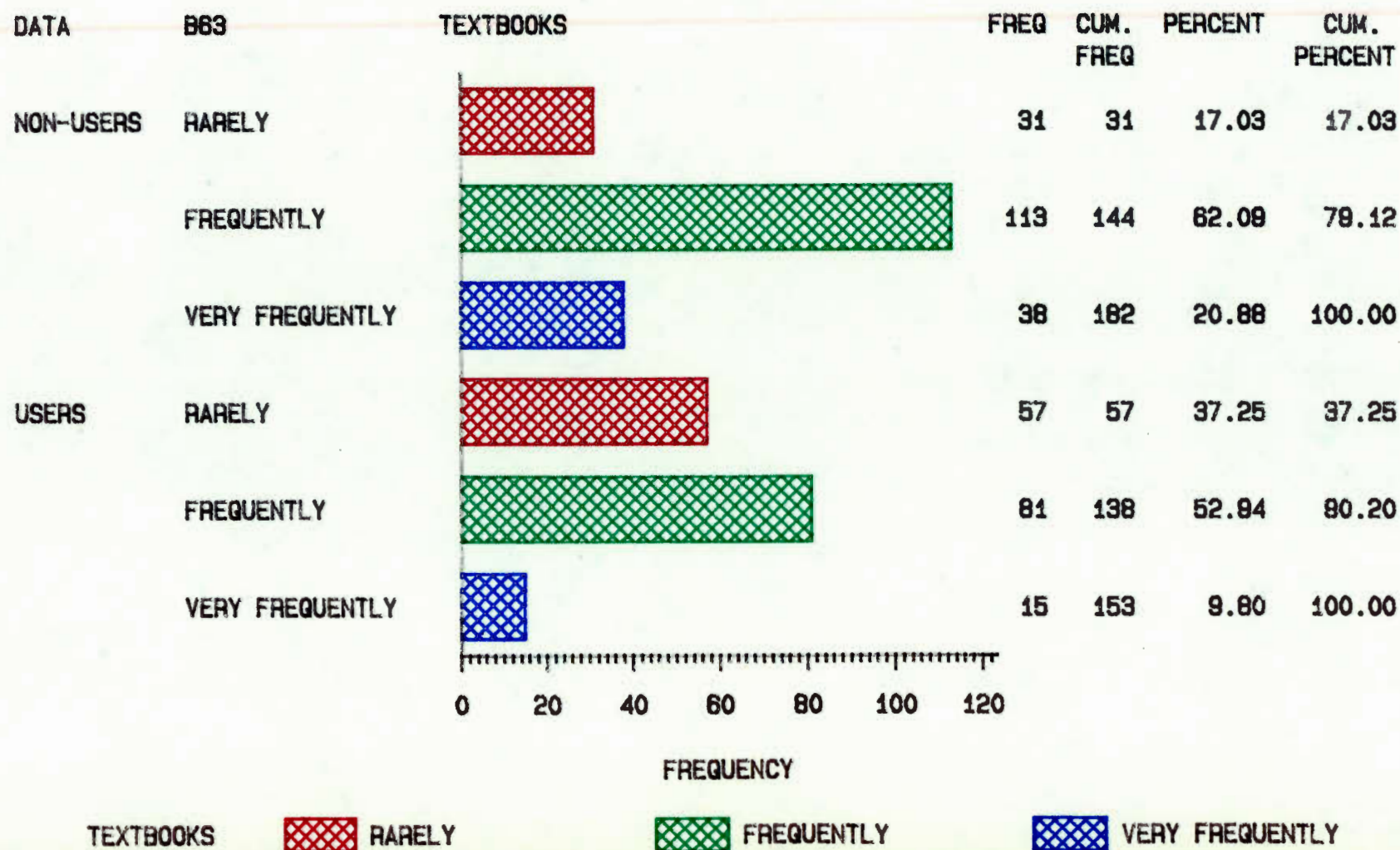
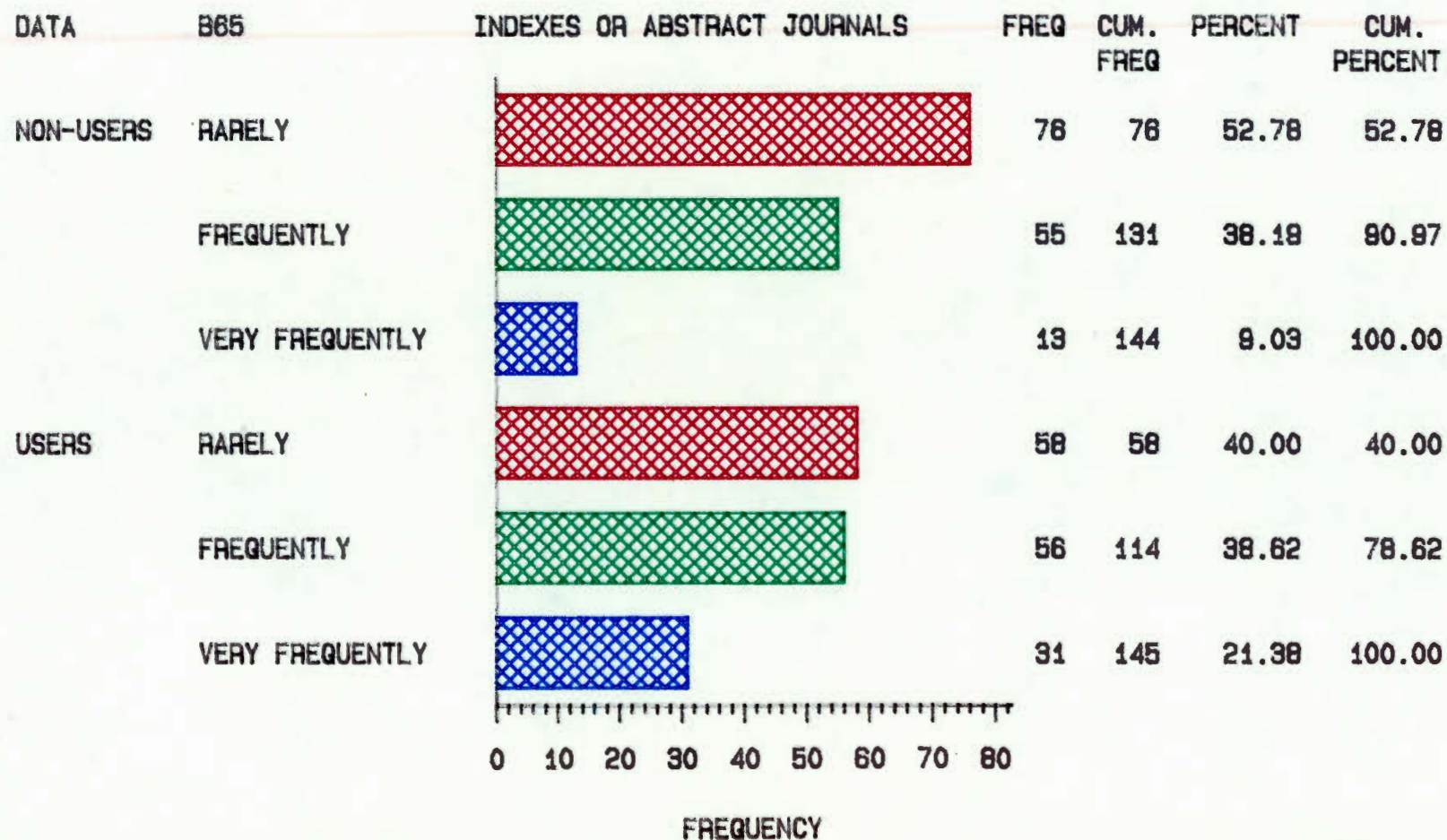



TABLE 21 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO SOURCE OF REFERENCES :
 INDEXES OR ABSTRACT JOURNALS



LEGEND: B65

 RARELY

 FREQUENTLY

 VERY FREQUENTLY

6.12 Comparison of non-users and users by possession of a personal reference collection Question: Part B, No 9; Table 22

There was a significant difference ($P=0.0001$) between the two groups, 87% of the users maintaining a personal collection, compared to 70% of the non-users. Of the non-users, 30% did not have such a reference collection compared to 13% of the users.

6.12.1 Comparison of non-users and users according to filing system of personal collection Question: Part B, No 10.1-10.5; Tables 23-25 & 55 Appendix A

Arrangement of the collection by author is not widely used but according to the responses there was a significant difference ($P=0.0001$) between the groups in the arranging of their personal literature collections according to the author. Of the users, 32% used this method compared to 11% of the non-users.

The responses showed filing by subject to be a common method of arrangement, with 83% of non-users and 79% of users adopting this system of filing. No significant differences was measured between the groups in their use of this method.

Arranging the collection by journal was not a method commonly used as only 20% of the non-users and 6% of the users used it. Where it was used a significant difference was measured between the groups ($P=0.0004$). It may be that journals rather than articles are the more common item in these collections in the non-user group.

TABLE 22 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO POSSESSION OF A
 PERSONAL REFERENCE COLLECTION



Filing of the collection by keywords was not common but a significant difference ($P=0.0112$) was measured between the groups. The method was used by 19% of the users compared to 8% of the non-users.

The responses to an open-ended question as to 'other' methods indicated that no major methods of filing personal reference collections had been overlooked by the researcher in identifying the multiple choice responses for this question. Ten non-users and 6 users had mainly one other method. This was a random arrangement in the office, in other words no arrangement.

6.13 Level of interest in systems of filing personal literature collection

Question: Part B, No 11

This question was used to determine the interest of both groups in the maintenance and order of their private collections. The number of responses indicating such interest was high, being 80% of the non-users and 85% of the users. Several respondents added unsolicited comments to their responses indicating that they were very interested in such information. No significant difference was measured between the groups.

TABLE 23 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO FILING SYSTEM OF
 PERSONAL COLLECTION: BY AUTHOR

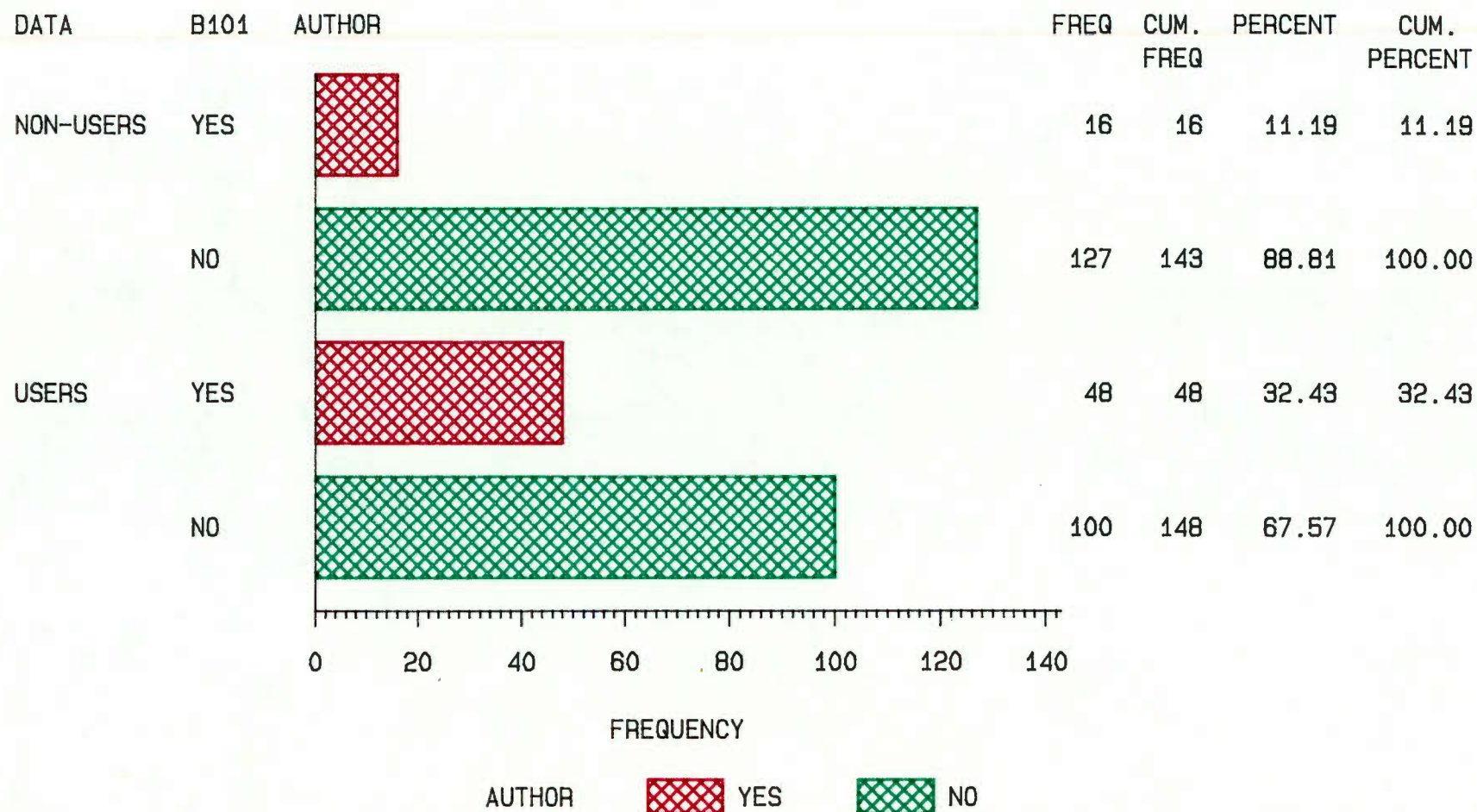


TABLE 24 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO FILING SYSTEM OF
 PERSONAL COLLECTION: BY JOURNAL

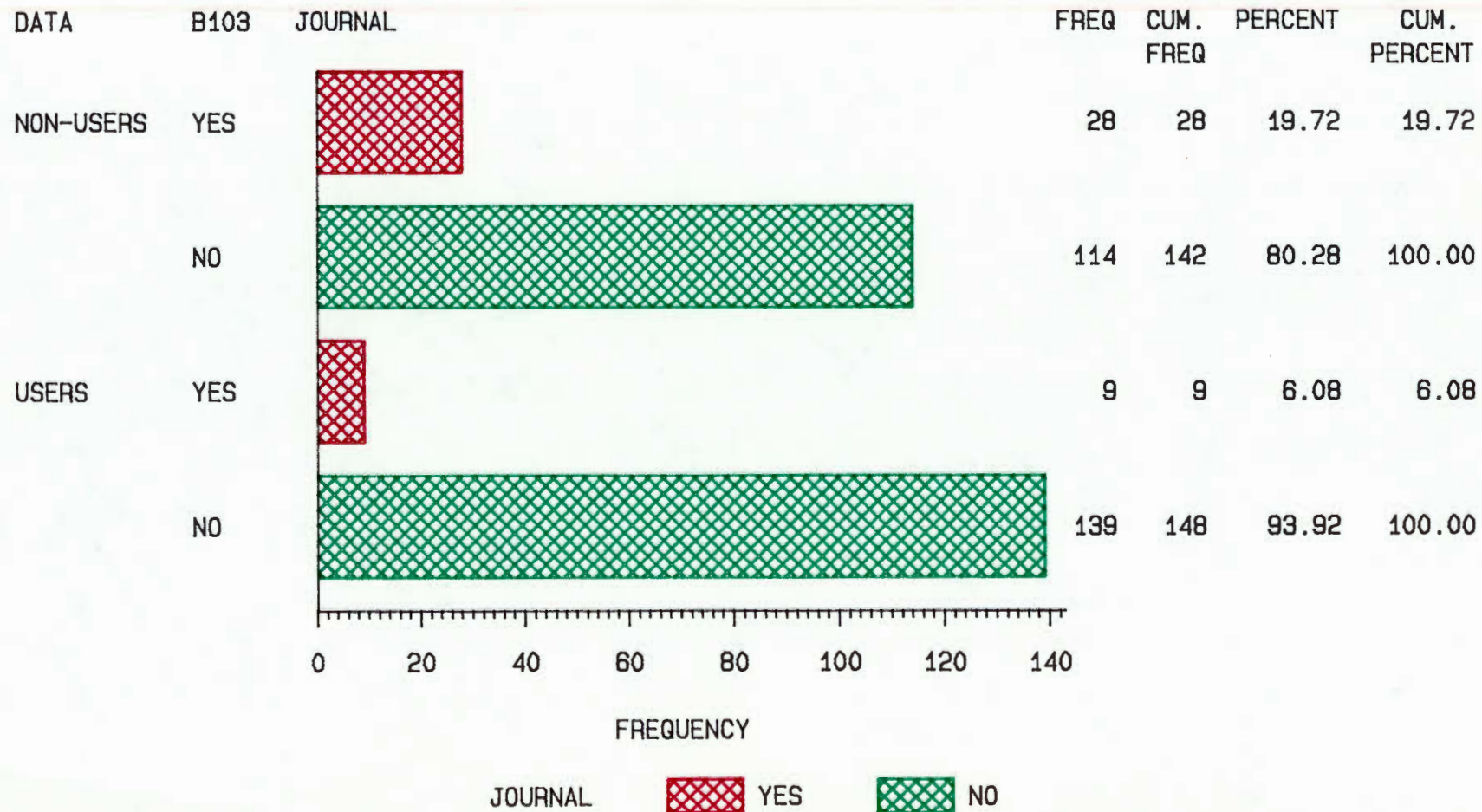
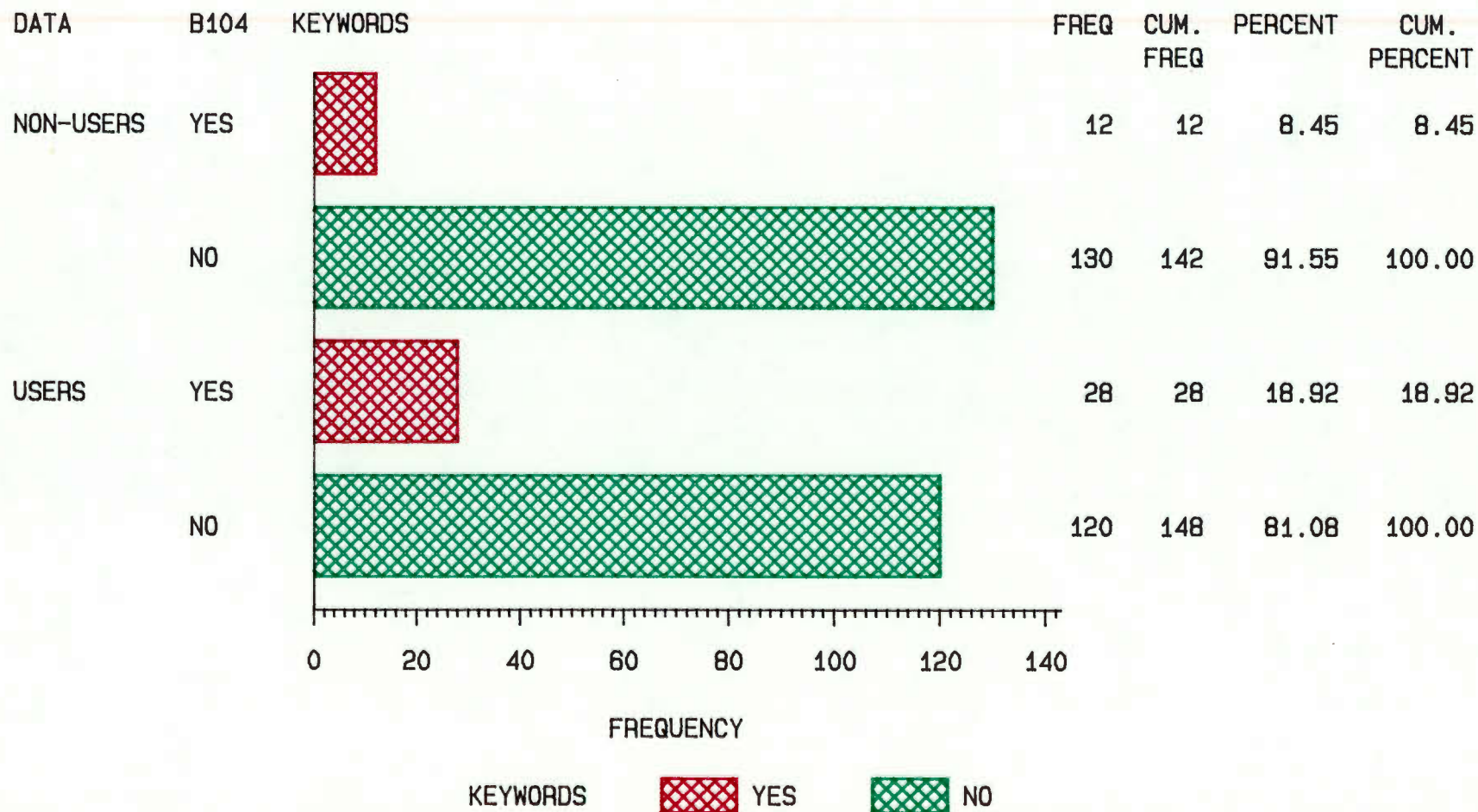


TABLE 25 : COMPARISON OF NON-USERS AND USERS
 ACCORDING TO FILING SYSTEM OF
 PERSONAL COLLECTION: BY KEYWORDS



PART C: The awareness and attitude of non-users to IML and to searching computerised databases

6.14 Introduction

Part C of the non-user form (Appendix C3) was designed to obtain information about the previous experience of, and attitude to, the searching of computerised databases by the respondents (cf 5.4).

6.14.1 Previous experience of computerised literature searches Question:
Part C, No 1-3; Table 26

To this question, 249 responses were received and of them 48 showed that the respondent had used the services of IML previously. A further 21 respondents had had experience of computerised literature searches through other organisations and 7 of these had used an organisation based in South Africa and 13 an organisation overseas. Only one of this group of 21 said the results had been unsatisfactory and therefore it appears unlikely that the respondents with previous experience may have been discouraged by previous unsatisfactory results.

Table 26: Previous experience of non-users with computerised literature searches

	<u>NUMBERS</u>	
	<u>YES</u>	<u>NO</u>
Used computerised searches before	69	174
Search done by IML	48	N/A
Search done by other S A organisations	7	N/A
Search done by overseas organisation	13	N/A
Not sure who did it	1	N/A
Were results satisfactory?	20	1

6.14.2 Attitude to computerised literature searches Question: Part C, No 4; Table 27

The responses obtained to the questions about their attitude to such searches indicate that the main reason for being uncertain about this method of information retrieval was due to lack of knowledge about it as 73% of the respondents gave this response. The charges were given by 17% as a reason why they did not use it while 18% said they had no need to use it. Only 1% said their negative attitude was caused by the results of searches they had seen.

Table 27: Reasons for being unsure about using computerised literature searching

	<u>PERCENTAGE</u>		
	<u>Yes</u>	<u>No</u>	<u>Total</u>
The charges	17	83	100
Results of searches seen by respondent	1	99	100
No need for it	18	82	100
Not enough known about it	73	27	100

Therefore it would appear that the majority of the non-users do not know enough about computerised literature searching to motivate them to use the method.

6.14.3 Non-users awareness of IML Question: Part C, No 6; Table 28

The respondents were questioned about whether they had heard of IML and if so, by what means. Hundred and three respondents had not heard of IML and of the 98 respondents who had heard of IML 54% had heard by way of a colleague, 10% by way of a library and 7% from staff members of IML. The remainder could not remember (18%) or had heard via material received in the post (10%).

Thus more than half of the respondents had not heard of IML and where they had, it seems that word of mouth is by far the most common method of creating awareness of IML.

Table 28: How respondents heard about IML

	<u>PERCENTAGE</u>	<u>NUMBER</u>
Through a colleague	55	54
Through a library	10	10
From IML staff	7	7
Do not know	18	18
Other	<u>9</u>	<u>9</u>
	<u>99</u>	<u>98</u>

The total of 99% is caused by rounding off the figures.

6.14.4 Attitude of non-users to future use of IML Question: Part C, No 7;

Table 29

Respondents who had heard of IML were asked to indicate if they would use the services of IML for literature searching in future. Of the 94 responses, 68% replied they would consider using IML in future, 13% were not certain about using IML and 19% said they would prefer to stay with their present methods.

Table 29 Would you consider using IML for your next literature search?

	<u>PERCENTAGE</u>	<u>NUMBER</u>
Yes	68	64
Maybe	13	12
No	<u>19</u>	<u>18</u>
	<u>100</u>	<u>94</u>

PART D: The survey of non-respondents

6.15 The non-respondent non-user sample

The data from the survey of the non-respondents was analysed by the SAS package (cf 5.9.3). The number of responses in sample was too small to permit more than the calculation of simple percentages for the variables. These data were compared with that from the non-user sample to identify any trends that were similar in both groups. Whilst similar trends could be identified in some variables none were apparent in others.

From the data it would appear that no major differences could be established between the two groups and thus the responses obtained from the non-user group can be regarded as representative of the population. In tables 30-37 the symbol N/R = non-respondent and R = respondent, both being from the non-user group. All figures shown in the tables are in percentages.

6.15.1 Comparison of non-respondents and respondents according to age
(Table 30)

There appeared to be a greater proportion of non-respondents in the over 60 group, but no clear cut differences were apparent.

Table 30: Age

	<u>Non-Respondents</u>	<u>Respondents</u>
30 and below	Nil	-
31 - 40	30	37
41 - 50	30	22
51 - 60	10	23
60 and over	30	14

6.15.2 Comparison of non-respondents and respondents according to work type (Table 31)

From the table it can be seen that both groups have a similar tendency to be involved in patient care but not in research. The non-respondents are less involved in studying, administrative and teaching than are the respondents.

Table 31: Work type

	<u>Clinical</u>		<u>Research</u>		<u>Studying</u>		<u>Admin</u>		<u>Teaching</u>	
	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>
Not at all	20	11	70	24	40	8	50	16	22	4
Little	-	10	20	43	40	23	20	27	33	24
Average	20	22	-	20	20	52	20	35	33	45
Heavy	10	24	10	9	-	15	10	16	11	22
Very heavy	50	32	-	4	-	2	-	6	-	5

6.15.3 Comparison between non-respondents and respondents according to their method of locating references; (Table 32)

A similar trend can be detected in both groups in the use of colleagues, company representatives and computer databases as a source of reference material. No similarity in trends are apparent in the use of libraries.

Table 32: Method of locating references

	<u>Colleagues</u>		<u>Organis</u>		<u>Dept</u>		<u>Outside</u>		<u>Reps</u>		<u>Comp Database</u>	
	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>
Never	10	0	10	2	33	11	70	29	37	52	90	75
Rarely	10	7	40	6	22	12	20	39	50	26	10	16
Occasionally	20	36	20	24	22	20	-	25	-	19	-	5
Frequently	50	50	20	41	22	40	10	4	13	2	-	3
Very frequently	10	7	10	27	-	17	-	2	-	1	-	1

6.15.4 Comparison between non-respondents and respondents according to their literature searching style; (Table 33)

Similar trends are apparent in both groups for searching personally, reluctance to use a librarian, and to delegate the task of searching.

Table 33: Literature searching style

	<u>Search Personally</u>		<u>Ask Library</u>		<u>Ask Advice</u>		<u>Delegate</u>	
	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>
Never	11	1	55	50	40	17	77	83
Rarely	-	1	33	33	20	22	11	11
Sometimes	33	8	-	15	20	41	11	4
Frequently	11	29	11	2	10	17	-	1
Always	44	62	-	1	10	3	-	1

6.15.5 Comparison between non-respondents and respondents according to library use; (Table 34)

The non-respondents tend to use their organisation's library less frequently than do the respondents.

Table 34: Use of organisational library

	<u>N/R</u>	<u>R</u>
Daily	-	7
Weekly	20	47
Monthly	20	36
Less than monthly	60	10

6.15.6 Comparison between non-respondents and respondents in time spent keeping up to date; (Table 35)

No distinct difference could be seen between the two groups although the respondents appeared to spent slightly more time each week in keeping up with developments.

Table 35: Hours per week keeping up to date

	<u>N/R</u>	<u>R</u>
1 - 5	90	62
6 - 10	10	27

6.15.7 Comparison between non-respondents and respondents according to methods of keeping up to date; (Table 36)

An almost identical trend exists between the two groups in their methods of keeping up to date.

Table 36: Methods of keeping up to date

	<u>N/R</u>	<u>R</u>
Journals	100	96
Colleagues	90	87
Indexes	30	40
SDI Service	-	3

6.15.8 Comparison between non-respondents and respondents according to their source of references; (Table 37)

Similar trends in both groups are apparent in the use of journals, reprint exchange, conference proceedings and index or abstract journals as a source of reference material. A higher percentage of non-respondents make less use of text books for this purpose.

Table 37: Source of references

	<u>Journals</u>		<u>Reprints</u>		<u>Textbooks</u>		<u>Conferences</u>		<u>Indexes</u>	
	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>	<u>N/R</u>	<u>R</u>
Rarely	10	5	85	70	55	17	57	71	66	53
Frequently	60	45	15	26	44	62	33	26	33	38
Very frequently	30	50	-	4	-	21	-	3	-	9

PART E: The user group satisfaction with their search (Appendix C1 and C2)

6.16 Introduction

The user group were questioned on their satisfaction with the results of the search done for them by IML (cf Appendix C1 and C2). Only 3 out of the 203 respondents failed to indicate their level of satisfaction. Of those who replied 42% (N=84) said they were very satisfied, 48% (N=96) said they were satisfied and 10% (N=20) said they were not satisfied with their search results.

In the analysis of the data in this section it was not always possible to test the relationships statistically due to the fact that when applying the chi-square test 20% of the frequencies in some of the cells of the two-way tables were less than 5. Under these conditions the test cannot be considered valid. All data are presented in percentages in tables.

6.16.1 Level of satisfaction according to number of relevance of citations Question: Part C, No 1; Table 38

The data could not be tested statistically due to the low frequencies in some parts of the distribution (cf 6.16).

There was a definite relationship, however between level of satisfaction and percentage of relevant references produced by the search (precision ratio, C3.7.3). In the very satisfied group, the number of users obtaining a high percentage of relevant references was greater than in the not satisfied group. 50% of the very satisfied group stated that more than 60% of the references were relevant, whereas none of the not satisfied group did so. 84% of the not satisfied group obtained less than 20% relevant references compared to 6% of the very satisfied group.

Table 38: Percentage of relevant references - precision ratio

	<u>0 - 20</u>	<u>21 - 40</u>	<u>41 - 60</u>	<u>61 - 80</u>	<u>81 - 100</u>	<u>Total</u>
Very satisfied	6	18	26	37	13	100
Satisfied	16	32	25	21	6	100
Not Satisfied	84	5	11	0	0	100

6.16.2 Level of satisfaction according to elements of the citation

Question: Part C, No 2

The standard format chosen by IML in which to print the citations in the bibliographic list shows the author, title, source, abstract if available, and in lists prepared from the MEDLINE database, the keywords which describe the information. It is possible to arrange the printout according to certain of these elements to suit the purpose of the user. The list may be arranged alphabetically by the first author of the reference or alphabetically by the title of the source journal and similarly elements may be excluded if the user so desires. The respondents were asked to rank the order of the importance they attached to each element in the citation so that the format presently being used by IML could be checked against the level of satisfaction.

The chi-square test could not be applied to the data due to the low cell counts (cf 6.16) but the trend in all levels satisfaction was for the abstract to be considered important. The title was ranked as second in importance by both levels of satisfaction but the not satisfied group placed a higher importance on it than the other groups. The importance of the author and the journal was low in all groups who placed them in third or fourth place behind the abstract and title. There was no discernable pattern for the importance of the keywords in any group.

6.16.3 Level of satisfaction according to coverage of the search topic

Question: Part C, No 3; Table 39

The respondents were asked to indicate their assessment of how well the search topic had been covered by the search carried out for them by IML. The responses could not be analysed statistically (cf 6.16) but a definite trend was observed where the very satisfied users felt their topic had been well or very well covered. In contrast the not satisfied users considered their topic to be not well, or very poorly covered by the search. Those who said they were satisfied had a similar response pattern although they did not consider the search coverage to be as good as the well satisfied users.

Table 39: Coverage of search topic

	<u>Very</u> <u>Well</u>	<u>Well</u>	<u>Fairly</u> <u>Well</u>	<u>Not</u> <u>Well</u>	<u>Very</u> <u>Poorly</u>	<u>Total</u>
Very satisfied	51	46	2	0	0	99
Satisfied	13	42	35	9	1	100
Not Satisfied	0	5	20	60	15	100

6.16.4 Level of satisfaction according to documentation of search topic

Question: Part C, No 4; Table 40

The respondents were asked if they considered that their topic was well documented in the literature, rarely documented, or was a new field with no

documentation. No statistical analysis was possible (cf 6.16) but when the responses for these factors were compared by the levels of satisfaction, it was observed that at all levels the majority considered their topic to be well documented.

There were, however, a reasonable number of users who considered that their topic was not well documented.

Table 40: Documentation of research topic

	<u>Well</u>	<u>Rarely</u>	<u>None</u>	<u>Total</u>
Very Satisfied	67	30	3	100
Satisfied	51	41	8	100
Not Satisfied	50	44	6	100

6.16.5 Level of satisfaction according to source of new relevant references Question: Part C, No 5; Table 41

The references provided in the list of citations provided to the user are drawn from a wider range of journals than the user could hope to read regularly. The respondents were asked to classify the sources of the new relevant references provided in the list according to their source. They were also asked if the search had provided very few relevant references.

A significant difference ($P=0.0075$) was noted where new references were provided from the journals normally read by the respondents. The not satisfied group said that very few references unknown to them were provided from this source. Quite a few very satisfied and satisfied users (51% and 46% respectively) were provided with such references. A similar pattern and a significant difference ($P=0.002$) was also observed where references were produced in the list which came from journals not normally seen by the user.

Sources of references other than journals which were used or not used showed no significant differences between the levels of satisfaction and the responses were fewer for this source ($N=32$ and $N=79$ respectively).

Table 41: Sources of relevant citations

	<u>Scanned</u> <u>Journals</u>	<u>Other</u> <u>Journals</u>	<u>Scanned</u> <u>Sources</u>	<u>Other</u> <u>Sources</u>	<u>No</u> <u>References</u>
Very Satisfied	51	46	47	37	22
Satisfied	46	48	50	54	33
Not Satisfied	<u>3</u>	<u>6</u>	<u>3</u>	<u>9</u>	<u>44</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>99</u>

6.16.6 Level of satisfaction according to number of relevant references not in list Question: Part C, No 6; Table 42

It was not possible to analyse this data statistically (cf 6.16) but trends were observed from the data. In the very satisfied category 48% of the

respondents said they did not know of any references that had been missed. A similar pattern occurred with the satisfied group but 47% of the not satisfied group said that they knew of 20 or more references that were missing.

This correlates well with the responses to the question about the percentage of relevant references in the list produced by the search (cf 6.16.1)

Table 42: Number of relevant references missing

	<u>None</u>	<u>1 - 5</u>	<u>6 - 10</u>	<u>11 - 20</u>	<u>20+</u>	<u>Total</u>
Very Satisfied	48	17	16	1	18	100
Satisfied	30	18	21	13	18	100
Not Satisfied	11	5	21	16	47	100

6.16.7 Level of satisfaction according to preferred arrangement of citations in the bibliographic list Question: Part C, No 7; Table

43

The respondents were asked to indicate their preference for the arrangement of the bibliographic list by the elements, first author, alphabetically by journal or by chronological order of publication of the article.

No statistical analysis was possible (cf 6.16). The majority of respondents in all groups showed a preference for the references to be arranged in chronological order of appearance.

Those respondents who preferred the "other" option and stated their preference said they would like to have their citations arranged by subject.

Table 43: Preferred arrangement of citations

	<u>First</u>	<u>Journal</u>	<u>Chronological</u>	<u>Other</u>	
	<u>Author</u>	<u>Order</u>	<u>Order</u>		
Very Satisfied	25	25	46	4	100
Satisfied	12	39	46	4	100
Not Satisfied	16	32	47	5	100

6.16.8 Attitude to keywords used according to level of satisfaction

Question: Part C, No 8; Table 44

The respondents were asked to indicate whether they would alter the keywords used in the search, either by changing them or adding to them, or would they make no changes, if the search was repeated.

A significant difference ($P=0.0035$) was measured between the groups in regard to the use of extra keywords. The percentage of respondents who would use extra keywords if the search was repeated decreased as the satisfaction level increased, in the not satisfied group 74% would use extra keywords compared to 35% in the very satisfied level.

No significant difference ($P=0.1657$) was measured between the groups regarding the replacing of the keywords used. A significant difference ($P=0.0040$) was measured between groups with regard to leaving the keywords as they are. The inclination to make no changes increased with the level of satisfaction, only 11% of the not satisfied group would make no changes compared to 55% of the very satisfied group.

Table 44: Responses to keyword adjustment

	<u>Use extra</u>	<u>Replace</u>	<u>No Change</u>
	<u>Keywords</u>	<u>Keywords</u>	
Very Satisfied	35	15	55
Satisfied	53	17	36
Not Satisfied	74	33	11

Eighteen respondents said they had received only a few or no relevant references and there was a significant difference ($P=0.0001$) between the groups. As 55% of those who obtained no relevant references were satisfied or very satisfied compared with 44% not satisfied users who had no relevant references provided.

6.16.9 Level of satisfaction according to timeliness of results of search

Question: Part C, No 9 and 10; Table 45

The respondents were asked to indicate their reaction to the time elapsed between requesting and receiving the results. Most respondents received their results within four weeks of requesting the search.

No statistical analysis was possible (cf 6.16) but the majority of users in all levels of satisfaction received their results in time for their purpose. More not satisfied users received their printouts late than did the other groups.

Table 45: Timeliness of results of search

	<u>Ample</u> <u>time</u>	<u>Late, but</u> <u>in time</u>	<u>Too late</u>
Very satisfied	93	6	1
Satisfied	85	15	0
Not Satisfied	70	25	5

6.16.10 Level of satisfaction according to mail address of search results

Question: Part C, No 11; Table 46

The respondents were asked to indicate if their lists had been sent to them directly or via their library. No significant difference could be measured (P=0.5517) in the responses.

Table 46: Destination of printout

	<u>Direct</u>	<u>Via library</u>
Very satisfied	92	8
Satisfied	87	13
Not satisfied	85	15

6.16.11 Level of satisfaction according to attitude of IML staff Question:
Part C, No 12; Table 47

The respondents were asked to indicate their reaction to the attitude of the IML staff, if they had contacted them, whilst requesting a search. Of the five options listed by the researcher only three were used by respondents. The results could not be analysed statistically but 78% of the users had contacted the IML staff and all of these found the staff to be helpful.

Table 47: Attitude of IML staff

	<u>Very helpful</u>	<u>Helpful</u>	<u>No contact</u>
Very satisfied	77	6	17
Satisfied	59	12	29
Not satisfied	65	15	20

6.16.12 Level of satisfaction according to number of previous searches

Question: Part C, No 14; Table 48

The respondents were asked to indicate the number of searches they had previously requested IML to do for them. The responses did not permit statistical analysis. The non satisfied users tended to have had fewer searches done previously than the other groups.

Table 48: Number of previous searches

	<u>None</u>	<u>1 - 3</u>	<u>4 or more</u>
Very satisfied	47	26	27
Satisfied	60	30	10
Not satisfied	60	35	5

6.16.13 Level of satisfaction according to the fees charged for searching

Question: Part C, No 15; Table 49

The respondents were asked to indicate their attitude to the fees charged by IML for searching. No statistical analysis was possible but slightly more of the not satisfied group said the fees were too high. The majority considered the fees reasonable.

Table 49: Reaction to fees charged

	<u>Too high</u>	<u>Reasonable</u>	<u>Too low</u>
Very satisfied	4	94	2
Satisfied	9	90	2
Not satisfied	13	88	0

6.16.14 Levels of satisfaction according to the method of initiating the search Question: Part C, No 16

The respondents were asked to indicate the manner in which they had contacted IML in order to have their search request dealt with. No statistically significant result was obtained when the level of satisfaction was correlated with the method of search initiation. No trend was established as to the method of initiation within each level of satisfaction. The majority of respondents within all levels of satisfaction did not visit IML personally.

CHAPTER 7

CONCLUSIONS

In this chapter the researcher will present the main conclusions reached in the empirical study (cf Chapter 6). These will be correlated with the results of studies reported in the literature (cf Chapter 3). The resulting synthesis will be used to show whether the hypotheses of the study (cf 2.2) have been positively or negatively proven.

The conclusions will be presented in terms of the framework suggested in chapter 3. Firstly the findings related to user satisfaction will be dealt with. Secondly the effects of age, rank and work activity type on usage will be dealt with. Thirdly the findings of the study as to the use of channels of information will be dealt with. Fourthly the findings related to the awareness and attitude of non-users to IML will be dealt with. Within each area the findings of the literature survey will be given first followed by those from the empirical study and finally a comment relating to both will be given.

7.1 The satisfaction of expressed user needs

7.1.1 General

a) The literature survey

The literature surveyed clearly indicated the inherent problems in measuring need specifically and even when measuring satisfaction difficulties are encountered. (cf 3.4.2 and 3.4.3). Whilst criteria can be established to assist in the measurement of satisfaction of expressed needs it was suggested that the first step should be the subjective judgement of the user as to whether he is satisfied with the services offered by an information system. The users could, for example, be asked to judge the value of the results of a literature search conducted by the system to satisfy an information need.

b) The empirical study

The users of IML were asked to indicate their satisfaction with the search carried out for them by IML according to a three part scale of satisfaction. Slightly under half of the respondents stated they were very satisfied with their search and only a minority said they were not satisfied (cf 6.16).

c) Comment

In assessing satisfaction of expressed needs in terms of services offered by IML there appears to be no reasonable alternative other than to ask the user to state how satisfied he was with the search results. The study revealed the low level of non-satisfaction with the results

and the high level of satisfaction achieved. Even allowing for the fact that some of these who opted for the middle level of response i.e. "satisfied", may have been reluctant to say they were not satisfied, the conclusion must be reached that the level of non-satisfaction was very low. It therefore appears to be apparent that the users' expressed needs are generally being met in varying degrees by the services provided by IML.

7.1.2 Satisfaction in relation to organisational factors

a) The literature survey

Little was located in the literature reviewed which dealt with what effect the physical format of the search output supplied would have on the level of satisfaction of the user. Similarly the timeliness aspect of online searching has not been investigated to any degree in the literature. The interaction of the user with the staff of the information service has been suggested as another factor which could influence the satisfaction level of the user. Once again, there appears to be very few research projects investigating this aspect, other than those which measured the effect of the presence of the user during the search on the subsequent level of satisfaction. The reports in the literature are not unanimous in agreeing that the presence of the user during the search process increases the level of satisfaction (cf 3.4.3.1). Fees as a factor in the use or non-use of online information service have, however, been extensively studied. The reports in the literature indicate that charging a reasonable fee has little influence on the use of such services provided the system charged fees for its services from its inception (3.4.3.1).

b) The empirical study

A number of factors were investigated to ascertain their relationship to user satisfaction. The arrangement of the list of references according to various layouts and the arrangement of the items within each reference contained in the search printout supplied to the user could not be correlated to any level of satisfaction (cf 6.16.2). No correlations could be established between the timeliness of the search results reaching the user and satisfaction. Questions posed to elicit reaction on the fees charged and the attitude of the staff of IML in relation to user satisfaction failed to produce evidence that these were connected to levels of satisfaction.

c) Comment

The findings of the empirical study agree with those reported in the literature that fees do not influence the user of online search services. The timeliness of the search in view of the special situation of South Africa (cf 3.4.3.1.2) caused no dissatisfaction. The user's opinion of the attitude of the staff of IML was positive. It may be concluded therefore that the organisational factors studied had no negative influence, at their present level, on user satisfaction in this study.

7.1.3 Satisfaction in relation to the output of the search

a) The literature survey

The findings reported in the literature relating to the satisfaction of a user of online services suggest that the provision of relevant

references in the search output is a key factor in satisfying the requirements of the user except, of course, where the user expects none to be found on the search topic (cf 3.4.3). Reports in the literature suggest that the presence of the user during the interactive search process could lead to more relevant references being retrieved than would be the case if the user was absent (cf 3.4.3.1.3).

b) The empirical study

The satisfaction of the user in relation to the results produced by the search was strongly correlated to the precision ratio of the search. In general, higher precision ratios were related to a high level of satisfaction. The negative correlation also held good in that non-satisfied users reported that more relevant references had been missed than did the satisfied or very satisfied users (cf 6.16.1 & 6.16.6).

There was a strong positive correlation between the user's opinion of how the search topic was dealt with by IML and their level of satisfaction (cf 6.16.3 & 6.16.4). A similar direct relationship was measured regarding the inclination of the user to change the keywords, used in the search, should the search be repeated, and the dissatisfaction of the user i.e. the non-satisfied user was more inclined to amend the list of keywords used to describe the search topic than was the satisfied user if the search was re-run.

c) Comment

The findings reported in the study corroborate those revealed in the literature survey whereby the positive relationship between precision

ratio and satisfaction is reported. The negative correlation that a low precision ratio could be equated with a low level of satisfaction was also observed.

This is corroborated to some degree by the observation that more non-satisfied users than satisfied users would amend the keywords used to describe their topic if the search was re-run. This finding could mean that the non-satisfied users did not describe their topic clearly when requesting a search and thus fewer relevant references were retrieved. This observation, that non-satisfied users felt their topic was not well covered, may also be related to a search analyst conducting the search in the absence of the user but this observation could not be analysed statistically due to the small number of not satisfied users. No trend, however, was observable in the rail data to substantiate this possibility.

7.2 Variables affecting use and non-use of IML

7.2.1 Age and rank

a) The literature survey

The literature reviewed showed that the variable of age was strongly correlated with the use of computerised information services in that older individuals were less likely to use such services (cf 3.5.1). Senior staff were also found to be less likely to use such a service than junior staff.

b) The empirical study

These variables were investigated for their effect upon the use or non-use of IML and were found to have a significant effect. There was a strong correlation between age and use as there were significantly more users under the age of 30 than there were non-users and there were considerably more non-users than users over the age of fifty (cf 6.3). However, in testing the variable of rank against use of IML more senior and junior staff used the service compared to non-users in the same rank groups.

c) Comment

The studies in the literature relating to the effect of age upon use are corroborated by this study except for the finding that senior ranks are featured more strongly in the user group. The researcher can only conjecture that in South Africa there is not a strict correlation between age and rank or that possibly the senior ranks are more involved with research than is the case elsewhere. The fact that the older respondents tended to be non-users may be due to a reluctance to alter set information seeking habits developed at an earlier age.

7.2.2 The type of work activity

a) The literature survey

The literature reviewed indicated that work activity type had an influence on the information seeking behaviour this being reflected in the use of the various channels of information. Those involved in

research activities tended to use formal channels of information to a greater degree than did individuals whose commitment was more towards patient care. Those whose requirements was for information to assist them in adding to scientific knowledge had different needs and thus information requirements and hence used different channels compared to those individuals who sought to apply knowledge to a situation such as patient care. In the biomedical field it was observed that research oriented individuals would use computerised information retrieval systems as a channel of communication more than would those concerned principally with patient care (cf 3.5.2 and 3.6.3.4).

b) The empirical study

The user and non-user groups showed significant differences between their involvement with the main work type activities. The user group had a greater involvement in research activities and studying than did the non-user group who conversely spent more time with patient care and teaching. No difference was measured in the administrative burden of both groups (cf 6.4).

c) Comment

The findings of this study confirm the patterns reported in the literature where the type of work activity influences the information need of the individual and thus the information seeking behaviour which is the manifestation of the need. The patterns of information seeking behaviour exhibited by the respondents in this study show that a service such as is presently provided by IML is perhaps better suited to the needs of those individuals whose task it is to conduct research to advance scientific knowledge rather than those who have a primary concern with using existing knowledge for a specific practical purpose.

7.3 The utilisation of various channels of information

a) The literature survey

The literature survey showed that those who favoured informal channels for obtaining information were more likely to be involved in patient care than research, or sought to use information for a practical purpose (cf 3.6.1). This work activity has previously been shown to be related to the non-use of computerised information services (cf 7.3.2). The findings reported in the literature survey indicate the importance of journals as a source of information but little has been reported in the literature regarding the use of textbooks as a channel of communication (cf 3.6.2.1).

Similarly the reports in the literature show that secondary literature as a channel of information communication plays a less important role for those who are involved in patient care, and the converse to hold good for hospital doctors and researchers (cf 3.6.2.2). The findings in the literature survey with regard to libraries as a channel of information showed that those whose work involved relatively more research duties than patient care duties used libraries more frequently. One study showed that general practitioners were reluctant to visit libraries situated at some distance from them to obtain information (cf 3.6.2.3). The limited reports available in the literature on the use of private reference collections showed that they were important channels of information but no reports were located which dealt with the arranging of the collection (cf 3.6.2.4).

b) The empirical study

There were differences between the user and non-user group in their use of colleagues as an informal channel of communication. The non-user group employed this channel of information more than did the user group both as a means of current awareness and as a means of locating information. Neither group used company representatives to any great extent to obtain information (cf 6.5 & 6.9).

Both groups employed the direct formal channel of communication of journals to a great degree as a means of current awareness, but in the location of references for a new project the user group used this channel of information more than did the non-user group. The use of textbooks as a channel was favoured more by the non-user group than by the user group. The exchange of reprints was not a major channel of information used by either group nor could any difference between the groups be measured (cf 6.9. & 6.10).

In the use of formal indirect channels of information significant differences could be demonstrated between the user sample and the non-user sample. The user group used the secondary literature as a channel of information, both for keeping up to date and for locating references, significantly more than did the non-user group (cf 6.9 & 6.10). Libraries were important to both groups as a source of material but differences in their use were measured between the groups. The user group visited the library more frequently and were more willing to use libraries outside their organisation than were the non-user group (cf 6.5 & 6.7). More users possessed a private reference collection than

did non-users but paradoxically the data revealed that non-users used this channel more than did users in locating references. This may be partially explained by the fact that no distinction was made between personal and departmental reference collections in the question on where references were located (cf 6.5 & 6.12). The organisation of these private collections suggested that the user group was more orientated towards information retrieval as they used authors or keywords in their personal indexing systems more than did non-users. The non-users favoured the arrangement of the collection by journal title (cf 6.12).

c) Comment

In the study the user group was clearly shown to use the formal channels of information, both direct and indirect, more than did the non-user group. The literature reviewed showed that use of the formal channels of information was favoured by those involved in research oriented activities rather than by those whose work activity involved practical applications of research results such as patient care.

7.4 The awareness of non-users of IML and their attitude to the services of IML

a) The literature survey

The literature survey showed clearly that non-awareness of the availability of information services was the main factor contributing towards non-use in a potential user population. The literature survey also revealed that an important channel of information whereby the availability of information services was made known was through colleagues rather than libraries (cf 3.7.1).

b) The empirical study

The study clearly revealed that over half of the non-users were unaware of the services offered by IML (cf 6.14). Those non-users who had heard of IML exhibited a positive attitude towards IML in that the majority stated they would consider using IML for future literature searching. The manner by which they became aware of IML was largely due to colleagues rather than through a library or from IML staff. The majority of the non-user group stated that the reason they were not sure about using computerised literature searching was because they did not know enough about it.

c) Comment

The findings of the survey as to awareness of non-users to the services of IML corroborate those located in the literature dealing with awareness of information services. The spread of awareness by informal channels appears to be more important than via formal channels such as a library. The spread of awareness via colleagues could be achieved either by promotional activities or literally by word of mouth. Despite the relatively low use of the library by the non-user group as compared to the user group reported previously, this channel of promotion should not be overlooked in creating awareness of information services amongst the non-user population.

7.5 Resumé of conclusions

From the data produced by the empirical study (Chapter 6) and the review of the literature (Chapter 3) it is possible to make the following conclusions in relation to the biomedical community.

- a) The users of computerised information retrieval services are drawn principally from the age group below 30 years but in relating use to rank both senior and junior staff are likely to be users.
- b) The users of computerised information retrieval services are more likely to be concerned with research related activities than patient care and to follow the same pattern of use of channels of information exhibited by the same work activity group as reported in the literature.
- c) Those who are non-users of the services of IML in this study are less likely to be involved in research and research related work activities and their patterns of use of channels of information is similar to those reported in the literature for the same work activity group.
- d) The patterns of use of information channels of the user group is different to that of the non-user group in that the user group tend to use formal channels of communication more than the non-users, who in turn, appear to be more relevant as informal channels of communication.
- e) Most of the non-users of information services were not aware of the availability of these services, however, the majority of the non-users in this study would consider using information services such as IML for their next major literature search.
- f) The expressed needs of the user respondents were satisfied by IML, the principal component of satisfaction being the retrieval of relevant references in the search result. Organisational factors were not a cause of non-satisfaction in the user group.

On the basis of these conclusions it is submitted that the following hypotheses as outlined in chapter 2.2 have been proven.

- i) The main reason for the non-use of the services of IML is non-awareness of the services offered by IML (cf 2.2.a).
- ii) Those who use the services of IML have their information needs met in that their expressed needs are satisfied (cf 2.2.b).
- iii) The use of the services of IML is influenced by age, rank, or work activity type (cf 2.2.d).

The following hypotheses was not proven by the study

- i) There is little difference in the information behaviour between users and non-users of the services of IML. The empirical study indicated that the user sample used different channels of information compared to those in the non-user sample. The user respondents showed a more dynamic approach to information channels using these more frequently and their attitude being more concerned with current information as evidenced by their use of secondary literature sources and their arrangement of personal literature collections (cf 2.2.c).
- ii) Non-users have no need for the services of IML at present, however some of the data on their use of information channels gathered in the empirical study showed that this group does have definite information needs which could possibly be met by information services such as those provided by IML (cf 2.2.a).

Finally as a result of the above conclusions it is evident that further research is required in two areas viz:

- a) It is recommended that the information needs of those in the biomedical community whose work activity type is not primarily in the area of research be investigated in order that their requirements may be met by information services such as IML.
- b) It is recommended that methods of publicizing and creating awareness of computerised information retrieval services such as offered by IML be investigated in order to bring these to the attention of the biomedical community of South Africa.

APPENDIX A

TABLES 50 - 55 SHOWING RESPONSES TO

OPEN-ENDED QUESTIONS NOS A.7.6, B.1.7, B.2.5,

B.5.5, B.6.6, B.10.5

Table 50: Comparison of non-users (N=22) and users (N=21) according to work type: other

	<u>Not at all</u>	<u>Little</u>	<u>Average</u>	<u>Heavy</u>	<u>Very heavy</u>	<u>Total</u>
Non-users	23	64	50	14	9	100
Users	48	5	28	14	5	100

Table 51: Comparison of non-users (N=14) and users (N=18) according to method of location of references: other means

	<u>Never</u>	<u>Rarely</u>	<u>Occasion- ally</u>	<u>Frequently</u>	<u>Very Frequently</u>	<u>Total</u>
Non-users	72	0	7	7	14	100
Users	66	11	6	6	11	100

Table 52: Comparison of non-users (N=12) and users (N=18) according to literature searching style: other methods

	<u>Never</u>	<u>Rarely</u>	<u>Occasion- ally</u>	<u>Frequently</u>	<u>Very Frequently</u>	<u>Total</u>
Non-users	67	0	17	8	8	100
Users	77	6	0	11	6	100

Table 53: Comparison of non-users (N=31) and users (N=16) according to method of current awareness: other means

	<u>Use other means</u>	<u>Do not user other means</u>
Non-users	16	10
Users	<u>84</u>	<u>90</u>
	<u>100</u>	<u>100</u>

Table 54: Comparison of non-users (N=5) and users (N=9) according to source of references: other means

	<u>Rarely</u>	<u>Frequently</u>	<u>Very frequently</u>	<u>Total</u>
Non-users	80	0	20	100
Users	56	11	33	100

Table 55: Comparison of non-users (N=10) and users (N=6) according to filing system of personal collection: other means

	<u>Other means</u>	<u>No other means</u>	<u>Total</u>
Non-users	9	91	100
Users	19	81	100

APPENDIX B

LITERATURE SEARCH REQUEST FORM

USED BY IML



**INSTITUTE FOR MEDICAL LITERATURE
of the
SOUTH AFRICAN MEDICAL RESEARCH COUNCIL**



**Telephone: (021) 931-2151
Telex: 57-20525 SA**

**PO Box 70
TYGERBERG 7505**

LITERATURE SEARCH REQUEST

Name:

Business Address:

Telephone:

GENERAL INFORMATION

A computerised literature search is done with the aid of a search profile, i.e. a combination of keywords or search terms used to express the topic on which information is required. Obviously the profile is constructed on the basis of information provided by you, the user. It is important therefore that this search request form be completed as fully as possible. In the case of current awareness services (SDI's), where you receive regular printouts of new references, continuous feedback by means of the evaluation cards provided with each printout is vital to ensure that the search profile is modified by us where necessary to increase the relevancy of retrieved citations.

As far as possible, the service is offered in conjunction with your usual library service, where assistance can normally be obtained in completing the form, guidance on appropriate data bases, and the provision of cited publications. Some university libraries will also pay the charges involved for their lecturing staff.

Although all requests are usually dealt with the same day they are received at IML-MIDS, it must be remembered that bibliographies are printed by the computer overseas and airmailed to us. It usually takes about two weeks for them to arrive. For interim use, a few citations are printed locally and sent to you by return post. A further point to remember is that every data base does not contain *all* scientific journals. A relevant citation may accordingly be missing from a particular search. For complete subject coverage a search against more than one data base may be necessary.

MIDS

MEDICAL INFORMATION DISSEMINATION SYSTEM

THE FOLLOWING SECTION MUST BE COMPLETED:

(See back page for charges)

My cheque for R..... is attached. (Made out to Medical Research Council)

My official order no. is attached.

Debit my MRC financial code no. (MRC Institutes only)

Please invoice me.

Please invoice:.....

.....
Date

.....
Signature

PLEASE INDICATE (✓) APPROPRIATELY:

DO YOU REQUIRE THE INFORMATION

- For research purposes
- For study purposes
- For writing a paper
- For writing a review
- For teaching purposes
- For current awareness

ABOUT HOW MANY REFERENCES DO YOU EXPECT

- A large number (100 +)
- A fair number (40 - 100)
- A few only (0 - 40)

WHICH LANGUAGES ARE USEFUL TO YOU

- English only
- English, Afrikaans and Dutch
- English and European languages
- All languages

MUST THE RESULTS BE RESTRICTED TO

- Experimental/animal work
- Clinical/human studies
- No restrictions

INFORMATION NEEDED

Give a narrative description of the subject on which information is required, listing main topic(s) and aspects thereof, e.g. *The treatment of bilharzia with nitroimidazoles.*

KEYWORDS/INDEX TERMS

If possible, consult a thesaurus such as MeSH (January issue of *Index Medicus*) to obtain a list of keywords which describe the topic. Group related terms together, e.g.

*BILHARZIA
SCHISTOSOMIASIS*

DRUG THERAPY

*METRONIDAZOLE
DIMETRIDAZOLE*

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REFERENCES

If possible, provide *recent* references on the topic:

a) AUTHOR: _____
TITLE: _____
SOURCE: _____

b) AUTHOR: _____
TITLE: _____
SOURCE: _____

c) AUTHOR: _____
TITLE: _____
SOURCE: _____

PLEASE INDICATE (✓) SEARCHES REQUIRED:

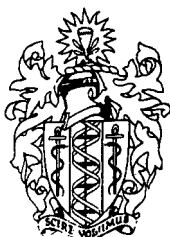
DATA BASE	CORRESPONDING TO	COVERAGE	RETROSPECTIVE SEARCH		SDI	
			<input type="checkbox"/>		<input type="checkbox"/>	
BIOETHICS	<i>Bibliography of Bioethics</i>	1973 to date	<input type="checkbox"/>	R20	—	—
BIOSIS	<i>Biological Abs/Bioresearch Index</i>	1974 to date	<input type="checkbox"/>	R45	<input type="checkbox"/>	R70
BIOSIS	<i>Biological Abs/Bioresearch Index</i>	1969 to date	<input type="checkbox"/>	R55	—	—
CAB	<i>Index Veterinarius, etc.</i>	1973 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
CACON	<i>Chemical Abstracts</i>	1977 to date	<input type="checkbox"/>	R45	<input type="checkbox"/>	R80
CACON	<i>Chemical Abstracts</i>	1972 to date	<input type="checkbox"/>	R50	—	—
CACON	<i>Chemical Abstracts</i>	1967 to date	<input type="checkbox"/>	R55	—	—
CANCERLIT	<i>Carcinogen Abs; Cancer Chemother</i>	1963 to date	<input type="checkbox"/>	R25	<input type="checkbox"/>	R40
CANCERPROJ	US Natl Cancer Institute	1977 to date	<input type="checkbox"/>	R20	—	—
CATLINE	Natl Libr Med Monograph Catalg	1965 to date	<input type="checkbox"/>	R25	—	—
CDA	<i>Comprehensive Dissertation Abs</i>	1861 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R50
CLINPROT	US Natl Cancer Institute	1976 to date	<input type="checkbox"/>	R20	—	—
COMPENDEX	<i>Engineering Index</i>	1970 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
CONF	<i>Conference Papers Index</i>	1973 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
ENVIROLINE	Environment Infor Center	1971 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
EMBASE	<i>Excerpta Medica</i>	1975 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
ERIC	Educational Resources Info Center	1966 to date	<input type="checkbox"/>	R40	<input type="checkbox"/>	R50
FSTA	<i>Food Sci Tech Abstracts</i>	1969 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R50
HISTLINE	<i>Bibliogr History of Medicine</i>	1970 to date	<input type="checkbox"/>	R20	—	—
HPA	<i>Health Planning & Admin</i>	1975 to date	<input type="checkbox"/>	R20	<input type="checkbox"/>	R40
INSPEC	<i>Computer & Control Abs</i>	1978 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
INSPEC	<i>Computer & Control Abs</i>	1969 to date	<input type="checkbox"/>	R50	—	—
IPA	<i>Intern Pharmaceutical Abstracts</i>	1970 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
LCMARC	US Libr Congress Monograph Catg	1974 to date	<input type="checkbox"/>	R40	—	—
LIFESCI	IRL Life Sciences Collection	1979 to date	<input type="checkbox"/>	R40	<input type="checkbox"/>	R50
MEDLINE	Index Medicus; Index Dental Lit.	1972 to date	<input type="checkbox"/>	R25	<input type="checkbox"/>	R50
MEDLINE	Index Medicus; Index Dental Lit.	1966 to date	<input type="checkbox"/>	R30	—	—
NTIS	National Technical Info Service	1964 to date	<input type="checkbox"/>	R45	<input type="checkbox"/>	R50
PA	<i>Pollution Abstracts</i>	1970 to date	<input type="checkbox"/>	R45	<input type="checkbox"/>	R70
PSYCHINFO	<i>Psychological Abstracts</i>	1967 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R60
RTECS	<i>Reg Toxic Effects Chem Substances</i>	Current ed	<input type="checkbox"/>	R20	—	—
SCISEARCH	<i>Science Citation Index</i>	1974 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R70
SOCIOL ABS	<i>Sociological Abstracts</i>	1963 to date	<input type="checkbox"/>	R45	<input type="checkbox"/>	R60
SOSCISEARCH	<i>Social Science Citation Index</i>	1972 to date	<input type="checkbox"/>	R55	<input type="checkbox"/>	R70
SPORT	<i>Sport Science & Recreation</i>	1949 to date	<input type="checkbox"/>	R50	<input type="checkbox"/>	R60
TOXLINE	<i>Toxicity Bibliography, etc.</i>	1977 to date	<input type="checkbox"/>	R30	<input type="checkbox"/>	R60
TOXLINE	<i>Toxicity Bibliography, etc.</i>	1974 to date	<input type="checkbox"/>	R40	—	—
TOXLINE	<i>Toxicity Bibliography, etc.</i>	1965 to date	<input type="checkbox"/>	R45	—	—
UKMARC	British Libr Monograph Catg	1974 to date	<input type="checkbox"/>	R30	—	—

APPENDIX C

QUESTIONNAIRES ON PERSONAL PROFILE

AND INFORMATION SEEKING BEHAVIOUR OF USERS

AND NON-USERS OF IML



INSTITUTE FOR MEDICAL LITERATURE
OF THE SOUTH AFRICAN MEDICAL RESEARCH COUNCIL [MRC]

P.O. BOX 70,

TYGERBERG 7505,

TELEX: 57-20525 SA

TELEPHONE: (021) 931-2151

OUR FILE:

KINDLY ADDRESS ALL

CORRESPONDENCE TO THE DIRECTOR

YOUR FILE:

1983

Dear

QUESTIONNAIRE ON COMPUTERISED DATABASES

The Institute for Medical Literature is presently evaluating its service and to assist in this we have produced the enclosed questionnaire.

We should appreciate it if you could help us by completing the questionnaire and returning it in the envelope provided. The answers in the section on SEARCH EVALUATION should refer to the printout of the search accompanying the questionnaire. If you have any problems with, or comments on, the form I would be pleased to have them.

Thank you in anticipation of your co-operation.

Yours sincerely

G A MILLIGAN
for DIRECTOR

INSTITUTE FOR MEDICAL LITERATURE - MEDICAL RESEARCH COUNCIL

QUESTIONNAIRE ON THE USE OF COMPUTERISED BIOMEDICAL DATABASES BY THE BIOMEDICAL COMMUNITY IN SOUTH AFRICA

INTRODUCTION:

The results of this questionnaire will be used to evaluate the services provided by the INSTITUTE FOR MEDICAL LITERATURE in order that these can be maintained at a high level and improved where possible. Strict anonymity will be observed in the use of the data. Please tick the block(s) that correspond to your answer. In some cases a written answer or elaboration is requested as well as, or instead of, a tick. Please feel free to elaborate or expand upon any aspect in the space after question 16.6 on page 9. Thank you for your cooperation.

--	--	--	--

PART A: PERSONAL PROFILE

- 1 University or organisation
- 2 Department
- 3 Position held - please give title
- 4 Is the post full time/part time (delete what does not apply)
- 5 Could you please list your qualifications and the year attained
-
-
- 6 Year of birth
- 7 Could you indicate your involvement in the following duties?

--

	Not at all	Very heavy	Heavy	Average	Little
7.1 Clinical duties/patient care					
7.2 Research					
7.3 Studying					
7.4 Administrative duties					
7.5 Teaching					
7.6 Other (please specify)					

PART B: INFORMATION ACTIVITY PROFILE

1 Please indicate the frequency with which you use the following approaches when seeking a substantial amount of reference material on a specific project/new field.

	Occa- sionally	Fre- quently	Never	Rarely	Very fre- quently
1.1 Consult colleagues					
1.2 Use your organisation's library					
1.3 Use private/departmental literature collections					
1.4 Use outside library or information facilities					
1.5 Use computerised databases					
1.6 Company representatives					
1.7 Other means (please specify)					

17

.....

2 In searching for reference material do you:

	Some- times	Fre- quently	Always	Rarely	Never
2.1 Search personally					
2.2 Ask the library staff to do it for you					
2.3 Seek their help but do it yourself					
2.4 Have an assistant do it					
2.5 Other means (please specify)					

.....

28

3 How frequently do you use your organisation's library?

- 3.1 Once a day or more
- 3.2 Once a week or more
- 3.3 Once a month or more
- 3.4 Almost never

29

--

4 How many hours do you estimate you spend each week on keeping up with the developments in your field?

--	--	--

5 How do you keep up to date?

- 5.1 By scanning journals
- 5.2 By discussions with colleagues
- 5.3 By scanning indexes or abstract journals
- 5.4 By a regular computerised SDI service
- 5.5 By other means. Please give details

.....

6 In what type of publication do you normally locate the references you need?

- 6.1 Journals
- 6.2 Reprint or offprint exchange
- 6.3 Textbooks, monographs
- 6.4 Conference proceedings
- 6.5 Indexes or abstract journals
- 6.6 Other (please specify)

	Fre- quently	Rarely	Very Fre- quently

7 If you have had one or more manual literature surveys done, or have done some yourself, during the past twelve months, how long did it take to complete the most recent one?

7.1 Hours

7.2 Days

7.3 Weeks

7.4 Months

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8 Does your group or department maintain its own private reference collection?

Yes	No	Don't know
<input type="text"/>	<input type="text"/>	<input type="text"/>

9 Do you maintain a personal reference collection for your work?

Yes	No
<input type="text"/>	<input type="text"/>

10 By what system is it arranged? By:

10.1 Author

10.2 Subject

10.3 Journal

10.4 Keywords

10.5 Other - please elaborate

<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>
<input type="text"/>

.....
:.....

11 Would you be interested in information about systems for personal reference storage?

Yes	No
<input type="text"/>	<input type="text"/>

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PART C: SEARCH EVALUATION SECTION

1 Of the list of references supplied to you by the INSTITUTE FOR MEDICAL LITERATURE, could you please indicate below the approximate percentage that you consider relevant?

1.1	0 - 20%	<input type="checkbox"/>
1.2	21 - 40%	<input type="checkbox"/>
1.3	41 - 60%	<input type="checkbox"/>
1.4	61 - 80%	<input type="checkbox"/>
1.5	81 - 100%	<input type="checkbox"/>

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2 In assessing the relevance of the references supplied, could you please rank the following in the order of importance to you for such assessment. Use numbers 1-2-3-4-5, where the 1 is of greatest importance and the 5 is of least importance. Enter the ranking number in the appropriate block, e g if you consider the abstract the most important enter a '1' in the block beside 2.1.

2.1	The abstract - AB on the printout	<input type="checkbox"/>
2.2	The title - TI on the printout	<input type="checkbox"/>
2.3	The authors - AU on the printout	<input type="checkbox"/>
2.4	The keywords - MH on the printout	<input type="checkbox"/>
2.5	The source journal - SO on the printout	<input type="checkbox"/>

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

3 Do you think that the references supplied covered your search topic:

3.1	Very well	<input type="checkbox"/>
3.2	Well	<input type="checkbox"/>
3.3	Very poorly	<input type="checkbox"/>
3.4	Fairly well	<input type="checkbox"/>
3.5	Not well	<input type="checkbox"/>

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4 Could you please indicate if you think that the topic of your search has been:

4.1 Well documented in the literature

4.2 Rarely documented in the literature

4.3 Not documented as it is a new topic

60

--

5 Did the list of references provide:

5.1 Relevant citations that were unknown to you from journals you normally scan

5.2 Relevant citations that were unknown to you from journals you do not scan

5.3 Relevant citations from other sources you normally use

5.4 Relevant citations from other sources you do not normally use

5.5 Very few or no relevant citations

6 Approximately how many relevant references do you think were not in the list supplied:

6.1 1 - 5

6.2 6 - 10

6.3 11 - 20

6.4 20 or more

6.5 Do not know of any

--

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7 The list of references supplied by the INSTITUTE FOR MEDICAL LITERATURE can be arranged in certain orders at the option of the user. Would you prefer:

- 7.1 To have them arranged by first author
- 7.2 To have them sorted by journal title
- 7.3 To have them arranged in chronological order of appearance in the literature
- 7.4 Others (please specify)

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8 Having studied the list of references and if you were to repeat the request would you:

- 8.1 Use extra keywords to describe your topic
- 8.2 Replace some of the keywords you supplied
- 8.3 Make no changes

9 Did you receive the printout from the INSTITUTE FOR MEDICAL LITERATURE:

- 9.1 In ample time for your purpose
- 9.2 Late but still in time
- 9.3 Too late to be used

10 How long did it take (approximately) from the time you requested the search until you received the printout?

11 Was the printout sent:

- 11.1 Direct to you by the INSTITUTE FOR MEDICAL LITERATURE
- 11.2 To your own library by the INSTITUTE FOR MEDICAL LITERATURE

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12 How helpful did you find the
INSTITUTE FOR MEDICAL LITERATURE
staff?

- 12.1 Very helpful
- 12.2 Helpful
- 12.3 Feel they could have been
more helpful
- 12.4 Not helpful
- 12.5 Had no contact with them

13 In assessing the results of your search request would you say:

- 13.1 It was very satisfactory
- 13.2 You were satisfied
- 13.3 You were not satisfied

14 How many computerised searches have you had done before by the INSTITUTE
FOR MEDICAL LITERATURE? Please give number.

15 Do you think the charges made by the INSTITUTE FOR MEDICAL LITERATURE
for the service provided are:

- 15.1 Too high
- 15.2 Reasonable
- 15.3 Too low

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16 When the INSTITUTE FOR MEDICAL LITERATURE did a literature search for you, did you:

16.1 Complete the green application form personally

16.2 Complete the green form with the assistance of colleagues

16.3 Complete the green form with the help of your library staff

16.4 Contact the INSTITUTE FOR MEDICAL LITERATURE by telephone to request a search

16.5 Visit the INSTITUTE FOR MEDICAL LITERATURE personally to request a search

16.6 Other (please specify)

.....

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Thank you for completing the questionnaire and for your cooperation in this survey.

MEDIESE NAVORSINGSRAAD - INSTITUUT VIR MEDIESE LITERATUUR

VRAELYS OOR DIE GEBRUIK VAN GEREKENARISEERDE BIOMEDIESE DATABASISSE DEUR DIE SUID-AFRIKAANSE BIOMEDIESE GEMEENSAP

INLEIDING:

Die inligting verkry uit hierdie vraelys sal gebruik word om die dienste van die Instituut vir Mediese Literatuur te evalueer ten einde 'n hoë standaard te handhaaf en verbeteringe aan te bring waar nodig. Die inligting sal as vertroulik behandel word. Maak asseblief regmerkies by die blokkie(s) wat ooreenstem met u antwoord. In sommige gevalle word 'n geskrewe antwoord gevra i p v of ter aanvulling van 'n regmerk. Die spasie op bladsy 9 mag gebruik word vir enige ander kommentaar wat u mag hê. Dankie vir u samewerking.

DEEL A: PERSOONLIKE INLIGTING

1				
---	--	--	--	--

- 1 Universiteit of organisasie
- 2 Departement
- 3 Pos beklee - gee amptelike benaming asseblief
- 4 Is u pos voltyds/deeltyds (skrap wat nie van toepassing is nie)
- 5 Lys asseblief u kwalifikasies asook die jaar verwerf
-
-
- 6 Geboortejaar

- 7 Gee asseblief 'n aanduiding van hoe betrokke u by die volgende aktiwiteite is.

	Glad nie	Baie swaar	Swaar	Gemiddeld	Min
7.1 Kliniese pligte/pasiëntversorging					
7.2 Navorsing					
7.3 Studies					
7.4 Administratiewe take					
7.5 Opleiding					
7.6 Ander (verskaf asseblief besonderhede)					

DEEL B: INLIGTINGSBEHOEFTES

1 Dui asseblief aan hoe dikwels u die volgende metodes gebruik wanneer u 'n aansienlike hoeveelheid inligting oor 'n spesifieke projek of nuwe gebied benodig:

	Soms	Dikwels	Nooit	Selde	Baie dikwels	
1.1 Raadpleeg kollegas						17
1.2 Gebruik u organisasie se biblioteek						
1.3 Gebruik private of departementele literatuurversamelings						
1.4 Gebruik buite biblioteek- of inligtingsfasiliteite						
1.5 Gebruik gerekenariseerde databasisse						
1.6 Maatskappyverteenwoordigers						
1.7 Ander metodes (verskaf asseblief besonderhede)						
.....						
.....						

2 Wanneer u verwysingsmateriaal soek, doen u dit soos volg:

	Soms	Dikwels	Altyd	Selde	Nooit	
2.1 Soek persoonlik						28
2.2 Vra die biblioteekpersoneel om dit vir u te doen						
2.3 Vra die biblioteekpersoneel se hulp maar soek self						
2.4 'n Assistent doen dit vir u						
2.5 Ander metodes (verskaf asseblief besonderhede)						
.....						

3 Hoe dikwels gebruik u u organisasie se biblioteek?

- 3.1 Een keer per dag of meer
- 3.2 Een keer per week of meer
- 3.3 Een keer per maand of meer
- 3.4 Amper nooit nie

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--

4 Hoeveel ure, skat u, gebruik u elke week om tred te hou met ontwikkelings op u gebied?

--	--	--

5 Hoe bly u by?

- 5.1 Deur tydskrifte vlugtig deur te lees
- 5.2 Deur besprekings met kollegas
- 5.3 Deur indekse of ekserptydskrifte ("abstracting journals") vlugtig deur te lees
- 5.4 Met behulp van 'n gereelde gerekenariseerde SDI diens
- 5.5 Deur ander metodes. Verskaf asseblief besonderhede

6 In watter tipe publikasie kry u gewoonlik die verwysings wat u benodig?

- 6.1 Tydskrifte
- 6.2 Uitruil van herdrukke of afdrucke
- 6.3 Leerboeke of monografieë
- 6.4 Kongreshandelinge
- 6.5 Indekse of ekserptydskrifte ("abstract journals")
- 6.6 Ander (verskaf asseblief besonderhede)

	Dikwels	Selde	Baie dikwels

7 Indien u een of meer literatuuropnames met die hand gedoen het of namens u laat doen het gedurende die afgelope twaalf maande, hoe lank het dit geneem om die mees onlangse een te voltooi? Merk asseblief die toepaslike blokkie.

7.1	Ure	<input type="checkbox"/>
7.2	Dae	<input type="checkbox"/>
7.3	Weke	<input type="checkbox"/>
7.4	Maande	<input type="checkbox"/>

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8 Behou u groep of departement sy eie private versameling verwysings?

Ja	Nee	Weet nie
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9 Behou u 'n persoonlike versameling verwysings vir u werk?

Ja	Nee
<input type="checkbox"/>	<input type="checkbox"/>

10 Hoe is dit gerangskik? Volgens:

10.1	Skrywer	<input type="checkbox"/>
10.2	Onderwerp	<input type="checkbox"/>
10.3	Tydskrif	<input type="checkbox"/>
10.4	Sleutelwoorde	<input type="checkbox"/>
10.5	Ander. Verskaf asseblief besonderhede	<input type="checkbox"/>

.....
.....

11 Sou u belangstel in inligting oor stelsels vir persoonlike verwysingsbewing?

Ja	Nee
<input type="checkbox"/>	<input type="checkbox"/>

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DEEL C: SOEKTOGEVALUASIE

1 Van die lys verwysings wat aan u voorsien is deur INSTITUUT VIR MEDIESE LITERATUUR, omtrent watter persentasie beskou u as relevant?

- 1.1 0 - 20%
- 1.2 21 - 40%
- 1.3 41 - 60%
- 1.4 61 - 80%
- 1.5 81 - 100%

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2 Dui asseblief die volgorde van belangrikheid van die volgende faktore aan wanneer u die relevansie van die gelewerde verwysings bepaal.

Gebruik nommers 1-2-3-4-5, waar 1 van die grootste belang is, byvoorbeeld indien u die opsomming as die belangrikste beskou, plaas u 'n '1' in blokkie 2.1

- 2.1 Die ekserp ("abstract") - AB op die drukstuk
- 2.2 Die titel - TI op die drukstuk
- 2.3 Die skrywers - AU op die drukstuk
- 2.4 Die sleutelwoorde - MH op die drukstuk
- 2.5 Die tydskrifverwysing - SO op die drukstuk

3 Hoe goed dink u, het die gelewerde verwysings u soektogonderwerp gedek?

- 3.1 Baie goed
- 3.2 Goed
- 3.3 Baie sleg
- 3.4 Redelik goed
- 3.5 Nie goed nie

4 Dui asseblief aan of u dink u soektogonderwerp:

- 4.1 Goed gedokumenteer is in die literatuur
- 4.2 Selde gedokumenteer is in die literatuur
- 4.3 Nie gedokumenteer is nie, aangesien dit 'n nuwe onderwerp is

60

5 Het die lys verwysings die volgende verskaf:

5.1 Relevante verwysings waarvan u nie geweet het nie uit tydskrifte wat u normaalweg deurgaans

5.2 Relevante verwysings waarvan u nie geweet het nie uit tydskrifte wat u nie normaalweg deurgaans nie

5.3 Relevante verwysings uit ander bronne wat u normaalweg gebruik

5.4 Relevante verwysings uit ander bronne wat u nie normaalweg gebruik nie

5.5 Min of geen relevante verwysings nie

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6 Omtrent hoeveel relevante verwysings, dink u, was nie in die verskafte lys nie:

6.1 1 - 5

6.2 6 - 10

6.3 11 - 20

6.4 20 of meer

6.5 U weet nie van enige nie

--

7 Die lys verwysings wat deur die INSTITUUT VIR MEDIËSE LITERATUUR verskaf word, kan volgens verskeie volgordes gerangskik word, soos verkies deur die gebruiker. Sou u verkies dat hulle gerangskik word:

7.1 Volgens eerste skrywer

7.2 Volgens tydskrifttitel

7.3 Volgens kronologiese volgorde van verskyning in die literatuur

7.4 Ander (verskaf asseblief besonderhede)

--

.....

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8 Nadat u u lys verwysings bestudeer het en indien u u aanvraag sou herhaal, sou u:

8.1 Ekstra sleutelwoorde gebruik om u onderwerp te beskryf?

8.2 Sommige van die sleutelwoorde wat u verskaf het, vervang?

8.3 Geen veranderinge aanbring nie?

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9 Het u die drukstuk van INSTITUUT VIR MEDIESE LITERATUUR:

9.1 Ruim betyds vir u doeleindes ontvang?

9.2 Laat, maar nogtans betyds ontvang?

9.3 Te laat vir gebruik ontvang?

10 Hoe lank ongeveer het dit geneem vir die drukstuk om u te bereik nadat u die soektog aangevra het?

.....

11 Is die drukstuk:

11.1 Direk aan u deur die INSTITUUT VIR MEDIESE LITERATUUR gestuur?

11.2 Aan u eie biblioteek deur die INSTITUUT VIR MEDIESE LITERATUUR gestuur?

12 Hoe hulpvaardig het u die personeel van INSTITUUT VIR MEDIESE LITERATUUR gevind?

12.1 Baie hulpvaardig

12.2 Hulpvaardig

12.3 U voel hulle kon meer hulpvaardig gewees het

12.4 Nie hulpvaardig nie

12.5 U het geen kontak met hulle gehad nie.

13 Hoe beoordeel u die resultate van u soektog?

13.1 Dit was baie bevredigend

13.2 U was tevrede

13.3 U was nie tevrede nie

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14 Hoeveel gerekenariseerde soektogte het u al tevore deur die INSTITUUT VIR MEDIESE LITERATUUR laat doen? Gee asseblief 'n syfer.

15 Dink u dat die tariewe wat deur die INSTITUUT VIR MEDIESE LITERATUUR vir hulle diens gevra is

15.1 Te hoog is?

15.2 Redelik is?

15.3 Te laag is?

16 Toe die INSTITUUT VIR MEDIESE LITERATUUR 'n literatuursoektog vir u gedoen het, het u:

16.1 Die groen aansoekvorm persoonlik voltooi?

16.2 Die groen vorm met die hulp van u kollegas voltooi?

16.3 Die groen vorm met die hulp van u biblioteek se personeel voltooi?

16.4 Die INSTITUUT VIR MEDIESE LITERATUUR geskakel om 'n soektog aan te vra?

16.5 Die INSTITUUT VIR MEDIESE LITERATUUR persoonlik besoek om 'n soektog aan te vra?

16.6 Ander (verskaf asseblief besonderhede)

.....

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Dankie dat u die vraelys voltooi het en vir u samewerking met die opname.

UNIVERSITY OF CAPE TOWN

(WITH WHICH IS INCORPORATED THE SOUTH AFRICAN COLLEGE)

TELEX : 57-22208

TELEPHONE: 69-8531

Director Ext. 496

Secretary Ext. 496



Leslie Social Sciences Building,

University of Cape Town,

RONDEBOSCH.

7700.

SCHOOL OF LIBRARIANSHIP

Dear

QUESTIONNAIRE ON COMPUTERISED INFORMATION SERVICES

Mr Milligan, one of our Masters students is at present engaged in research on the use of computerised data bases by the medical community in South Africa.

The objective of the research is to provide guidelines as to the improvement of the services presently offered in South Africa. The results will form part of a Master of Arts (Librarianship) at the University of Cape Town School of Librarianship.

It would be appreciated if you would cooperate by completing the attached questionnaire and returning it to me for forwarding to Mr Milligan.

Yours faithfully

A handwritten signature in black ink, appearing to be 'J G Smith'.

(Mrs) J G SMITH
SENIOR LECTURER

QUESTIONNAIRE ON THE USE OF COMPUTERISED BIOMEDICAL DATABASES BY THE BIOMEDICAL COMMUNITY IN SOUTH AFRICA

INTRODUCTION:

This questionnaire forms part of research being done towards an MA (Librarianship) thesis at the University of Cape Town, School of Librarianship. Strict anonymity will be observed in the use of the data. Please tick the block or blocks that correspond to your answer. In some cases a written answer or elaboration is requested as well as, or instead of, a tick.

PLEASE ANSWER ALL QUESTIONS IN FULL EXCEPT WHERE OTHERWISE INDICATED

PART A: PERSONAL PROFILE

- 1 University or organisation
- 2 Department
- 3 Position held - please give title
- 4 Is the post full time/part time (delete what does not apply)
- 5 Could you please list your qualifications and the year attained
-
-
- 6 Year of birth

--

7 Could you indicate your involvement in the following duties?

	Not at all	Very heavy	Heavy	Average	Little
7.1 Clinical duties/patient care					
7.2 Research					
7.3 Studying					
7.4 Administrative duties					
7.5 Teaching					
7.6 Other (please specify)					

11

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PART B: INFORMATION ACTIVITY PROFILE

1 Please indicate the frequency with which you use the following approaches when seeking a substantial amount of reference material on a specific project/new field.

	Occa- sionally	Fre- quently	Never	Rarely	Very fre- quently
1.1 Consult colleagues					
1.2 Use your organisation's library					
1.3 Use private/departmental literature collections					
1.4 Use outside library or information facilities					
1.5 Use computerised databases					
1.6 Company representatives					
1.7 Other means (please specify)					

.....

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2 In searching for reference material do you:

	Some- times	Fre- quently	Always	Rarely	Never
2.1 Search personally					
2.2 Ask the library staff to do it for you					
2.3 Seek their help but do it yourself					
2.4 Have an assistant do it					
2.5 Other means (please specify)					

.....

3 How frequently do you use your organisation's library?

3.1 Once a day or more

3.2 Once a week or more

3.3 Once a month or more

3.4 Almost never

4 How many hours do you estimate you spend each week on keeping up with the developments in your field?

.....

5 How do you keep up to date?

5.1 By scanning journals

5.2 By discussions with colleagues

5.3 By scanning indexes or abstract journals

5.4 By a regular computerised SDI service

5.5 By other means. Please give details

.....

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37

6 In what type of publication do you normally locate the references you need?

	Fre- quently	Rarely	Very Fre- quently
6.1 Journals			
6.2 Reprint or offprint exchange			
6.3 Textbooks, monographs			
6.4 Conference proceedings			
6.5 Indexes or abstract journals			
6.6 Other (please specify)			

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7 If you have had one or more manual literature surveys done, or have done some yourself, during the past twelve months, how long did it take to complete the most recent one? Please tick the appropriate block.

7.1 Hours	<input type="checkbox"/>
7.2 Days	<input type="checkbox"/>
7.3 Weeks	<input type="checkbox"/>
7.4 Months	<input type="checkbox"/>

8 Does your group or department maintain its own private reference collection?

Yes	No	Don't know

PART C: GENERAL INFORMATION SECTION

1 Have you ever had a computerised literature search done for you, or used the output from such a search?

1.1	Yes	<input type="checkbox"/>
1.2	No	<input type="checkbox"/>

If your answer is 'No', please omit questions 2 to 3 and go to question number 4 below.

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<input type="checkbox"/>

2 If your answer to the above was 'Yes', was the search prepared by:

2.1	The Institute for Medical Literature	<input type="checkbox"/>
2.2	Another South African organisation	<input type="checkbox"/>
2.3	An overseas organisation	<input type="checkbox"/>
2.4	Unsure (please give details)	<input type="checkbox"/>

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

3 Were the results satisfactory?

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

<input type="checkbox"/>

4 If you are unsure about computerised searching, is it because of:

4.1	The charges for searching	<input type="checkbox"/>
4.2	The results of searches you have seen	<input type="checkbox"/>
4.3	No need for it	<input type="checkbox"/>
4.4	Insufficient known about computerised searching	<input type="checkbox"/>
4.5	Other (please specify)	<input type="checkbox"/>

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>

.....
.....

5 Have you heard of the computerised literature search services offered by the INSTITUTE FOR MEDICAL LITERATURE/MEDICAL RESEARCH COUNCIL

5.1	Yes	<input type="checkbox"/>
5.2	No	<input type="checkbox"/>

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If your answer is 'No', you need not answer the remainder of the questions. Thank you for your cooperation in this survey. Please return the form in the envelope provided via the internal mail.

6 If 'Yes' to the above question, did you first hear by way of:

6.1	A colleague	<input type="checkbox"/>
6.2	A library	<input type="checkbox"/>
6.3	INSTITUTE FOR MEDICAL LITERATURE staff	<input type="checkbox"/>
6.4	Can't remember	<input type="checkbox"/>
6.5	Other (please specify)	<input type="checkbox"/>
	

7 Has your knowledge of the services provided by INSTITUTE FOR MEDICAL LITERATURE caused you:

7.1	To consider using them when next you need an extensive literature search done	<input type="checkbox"/>
7.2	To hesitate to use them when next you need an extensive literature search done. Please give reasons for response in the space below 7.3	<input type="checkbox"/>
7.3	To stay with your present approach	<input type="checkbox"/>

Thank you for your cooperation in this survey. The form should be returned in the envelope provided via the internal mail.

APPENDIX D

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