The availability of research journals in South African academic medical libraries

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Abstract **Biomedical researchers depend on the journals of science as a primary source of information. The spiralling cost of journals threatens the ability of libraries to provide their users' information needs. In this study the availability of a representative sample of journals used by South African biomedical researchers was determined at each of the seven medical faculty libraries. The application of a standardised document delivery test is described and the results are interpreted in terms of: (*i*) the capability index, which includes material obtainable through inter-library loans; and (*ii*) an availability index, or measure of the probability that a user will find an item without delay in his/her own library. The current status of availability of biomedical journals was found to be high at all the libraries; indeed, the scores compare favourably with results obtained at academic libraries overseas. There is, however, real concern that the financial crisis in tertiary education will cause the situation to deteriorate. Repetition of this test is recommended to monitor the (probably declining) level of journal availability. The information would support efforts to rationalise and subsequently strengthen academic medical libraries' collective holdings as a strategic national resource.**

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South Africa is considered the most prominent African country in academic medicine; indeed, its medical science contains pockets of internationally acclaimed research.[1] The act of publishing is frequently seen as the tangible result of scientific research and has become one of the criteria for measuring a scientist's productivity. As a matter of interest, medical publications contribute more than 50% of the total national research output emanating from South Africa.[2] Successful research presupposes not only access to adequate research funds for equipment and manpower, but also access to the scientific research literature. Journal publications are the preferred vehicle of recorded or documented research in biomedicine. The extent to which journals are accessible to biomedical researchers working in South Africa was investigated as part of a doctoral dissertation in Librarianship and Information Science.[3]

In the RSA, most of the researchers who receive funds from the South African Medical Research Council (MRC) are affiliated to one of the seven faculties of medicine. The libraries serving each of these faculties are responsible for providing the documents relevant to the information needed by 'their' researchers — whether from own stock or from external sources. The academic libraries are concerned about the high cost of their journal collections and are looking critically at the extent and nature of their use. There is a growing realisation that no library can attempt self-sufficiency when it comes to as expensive a resource as the journal collection, thereby adding urgency to the resource-sharing initiatives of the Inter-University Library Committee of the Committee of University Principals.

There was no known information on the level of availability of medical journals in South Africa, which made it necessary to establish some measurement of the existing state of affairs. The objective of the research project was not to compare the performance of individual libraries with one another, but rather to evaluate the national availability of the collective stock of biomedical research journals.

Methods

The so-called document delivery test (DDT) method was adapted and used to collect the data. The original DDT resulted from a survey commissioned by the Institute for Advancement of Medical Communication, USA, some 20 years ago and is a sound approach to measuring the ability of a library to provide documents to its users.[4]

The basic components required to conduct a DDT are: (*i*) a citation pool or list of bibliographical items; and (*ii*) a checklist or score sheet to record the data.

Since the citation pool should contain items that are typical of the information needs of the target group, the pool in this study was compiled from citations provided by South African biomedical researchers in their own recent (i.e. 1989) publications. The characteristics of the articles in the citation pool were found to be similar to those described in comparable studies of medical literature, thereby supporting the representative nature of the citation pool.[5,6] The bibliometric techniques utilised to analyse the characteristics of the literature and detailed findings are described elsewhere.[3]

The source publications were derived from the South African Medical Database (SAMED), a bibliographic database which is compiled and maintained by the Information Division of the MRC. SAMED indexes publications on medical research written by South African scientists or pertaining to medical issues relevant to South Africa. All recipients of MRC research support are, for instance, expected to supply the Division with a reprint of each publication they produce. In July 1990, SAMED contained 450 items that had been published during 1989; 320 of these were research papers linked to MRC funding. The set of 320 articles was the starting point for the construction of the citation pool.

The act of citing an article implies its use by the author or, according to Cronin:[7] 'Metaphorically speaking, citations are frozen footprints on the landscape of scholarly achievement; footprints which bear witness to the passage of ideas.' Most of the journal articles retrieved from SAMED contained references, from now on called citations, giving a total 'citation population' of 7 158 items, consisting of 6 298 journal articles (87,99%), 786 monographs (10,98%) and 74 other types of communication, e.g. 'unpublished report' (1,03%). The substantial (bibliographic) population allowed valid sampling. Sampling and verification reduced the pool to a manageable collection of 307 journal articles which had been published between 1910 and 1989 in 189 different journals. More citations referred to 1986 publications than any other date, pointing to the use of recent literature.

A simple checklist was designed to score the availability of items in the citation pool. The categories related to the accessibility of an item. The score reflected the actual status of each item on the day of the test. The best score was obviously for an item found on the correct shelf. Lower scores were given to items in categories corresponding to the approximate time lapse before it could be obtained, e.g. 2 - 3 weeks to receive an item through the national inter-library lending scheme.

All seven medical libraries were visited and tested during an active part of the academic cycle, between 22 and 31 August 1990. The Statistical Analysis System (SAS) was used for the processing and analysis of the data.

Results

The results of a DDT were interpreted by applying two complementary measures: the capability index according to Orr's formula[4] in which access to documents is interpreted beyond ownership to include the document delivery capability of a library through borrowing from other institutions, whereas the availability index used by Kantor[8] is a probability ratio of immediacy which determines the likelihood that a library will be able to supply an item without delay from its own resources. A summary of results obtained at the UCT Medical Library is used to illustrate the calculation of both these techniques.

Capability index (CI)

The capability index uses a simple arithmetical formula based on estimated time periods, i.e.

$$CI = \frac{5 - (\text{mean speed})}{4} \times 100,$$

where the mean speed is composite time/number of items (CI = capability index). 'Composite time' is a notional figure obtained from the product of the number of items in a category and the nominal value of that category, e.g., as shown in Table I, the 9 items in category 4 represent a composite time of 36. In the example of UCT Medical Library (Table I), the capability index equals 88,86.

TABLE I.
Results of DDT conducted at UCT Medical Library used to determine the *capability index*

	No. of items	Category	Composite time
On shelf	213	1	213
Accessible 1 - 5 days	60	2	120
Accessible 6 - 10 days	25	3	75
Accessible 11 - 15 days	9	4	36
Totals	307		444

Availability index

The availability index is a technique first used by DeProsporo and developed further by Kantor,[8] and interprets the results of a DDT from a different perspective. It is a probability measure that can be applied to any category within the test, e.g. what is the probability that a library would have acquired an item from the checklist? What is the probability that an item will be on the shelf? In the current study, only the probability of finding an item from the test sample on the correct shelf was determined, based on the same data collected during the DDT. The 213 items found immediately on the UCT Medical Library shelves expressed as a fraction of the total number in the sample of 307, provides an availability index of 0,694 (Table II). If there is a 69% chance of finding a required item on the shelf, conversely, there is a 31% chance of not finding it.

TABLE II.
Results of DDT conducted at UCT Medical Library used to determine the availability index

	No. of items	% of total	% of acquired
Total sample	307	100,00	N/A
Acquired by library	230	74,92	100,00
On shelf	213	**69,38***	92,61
Not on shelf	17	5,54	7,39
Circulation	5	1,63	2,17
Bindery	4	1,30	1,74
Other section	3	0,98	1,30
Found 2nd search	3	0,98	1,30
Unaccounted	2	0,65	0,87

*Availability index 0,694.

Discussion

It should be kept in mind that in measuring document delivery capability (capability index), the situation was very much a 'best case' scenario in which the system's potential to provide material from its own stock or from outside sources, not its acutal performance, was tested. The method of constructing the citation pool carried an unavoidable bias in favour of the performance of the system, since it is more likely that authors would use material readily available in their libraries. A different approach, using a neutral sample of citations from international sources, would have lost the high relevancy of the manifestly South African research.

High scores, ranging between 81,68 and 92,97, were achieved at all seven libraries with the hypothetical 'national average' at 87,8. The number of variables present when surveying seven different test sites necessitated the generalist or common denominator approach. Even so, the results of the South African study are high and indicate generous provision of journal literature at all the academic medical centres.

The availability index is especially useful for the analysis of a single system's performance, for instance focusing on the factors that cause time delays in document delivery, e.g. the duration of the unavailability due to backlogs in shelving. Its application to a series of libraries is, however, somewhat limited. The probability of ownership was the most usable function in the present exercise. In this study the availability index at the test sites ranged between 0,593 and 0,840. In a review of 40 availability studies, Mansbridge[9] reported large academic libraries as scoring on average 0,61; Kantor[6] reported results ranging between 0,50 and 0,60.

National collection

Some 31,6% of the items in the test sample were found to be in stock at each of the seven libraries. This represented 47 different journal titles, 97 individual articles. The publication date of a citation may place it in a different category from an older/more recent article that had appeared in the same journal. Only 9 items (2,93%) could not be traced in South Africa. The excellent document delivery services offered by both the British Library Document Supply Centre (BLDSC) and the National Library of Medicine (USA) provide prompt access — at a price. Currently the minimum charge for a photocopy from the BLDSC is R25,00. Technology provides the means of alerting the user to the existence of published information as well as the means of obtaining it, but technology is not cheap. In the end, availability may depend on affordability.

The accessibility of biomedical research journals in the RSA was found to be remarkably high. This assertion is supported by interpreting the results according to two methods, the calculation of a capability index as well as an availability index. In the present economic climate, however, academic medicine generally and the MRC specifically are severely hampered by lack of funding.[10] All the academic institutions and therefore also the medical libraries depend on the State for most of their funds. In 1991, and again in 1992, South African universities experienced severe cutbacks. The Rector of the Medical University of Southern Africa stated in a public interview that the very existence of his institution was threatened due to lack of sufficient funding. Other universities are all affected. Inevitably, libraries are cutting subscriptions and raising the cost of inter-library lending facilities, thereby weakening the collective journal pool. Staff resources are in jeopardy as budget cuts cause posts to be frozen and even abolished. These economic factors must have a negative influence on the national availability of journals and, unavoidably, on medical research which, in turn, is the basis of improved medical care. It is therefore critically important that resource sharing strategies be developed and that co-operative agreements be made to work in the national interest.

The results of the present study will soon be out of date. The DDT as diagnostic instrument can only be effective if the exercise is repeated every 3 - 5 years, using the same methodology; the data provided would monitor the health of the South African collective biomedical journal resource. Who has the time or money to do it?

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