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Medline base – CD-rom – retrieval and selection of the key words

KEYWORDS: Medline; Medical Subject Headings; Information Storage and Retrieval; Abstracting and Indexing; Cataloging

INTRODUCTION

Scientific information has been growing at an exponential level, and each year over 300.000 references are added to Medline base. There is now a growing interest on the bioinformatics researches to find ways to improve the ability to find relevant documents in the literature and to extract specific kinds of information from these documents (1,2).
Medline, one of the gamestones of medical scientific information system is a mainstay of medical research, esspecialy for current information (3).
The aim of this paper was to stress the importance of the Medline base and MESH thesaurus controlled vocabulary of the descriptors for retrieving, indexing and cataloging in providing the exact match of the documents specified in the users request, and most precise descriptors for indexing and cataloging that provide documents more retrievable in common librarian practice.

MEDLINE BASE

Medline base contains bibliographic references of all the biomedical articles, editorials and letters to the editor in approximately 4.800 scientific journals. At present, about 300.000 references are added to Medline yearly, up to over 11 million references from year 1950 to 2006 (1).
Medline is founded in the nineteenth century by dr John Shaw Billings who from 1865 to 1895 headed the forerunner of the National Library of Medicine (NLM). First volume of Index Medicus – a print publication was published in 1879 (4). Medical Subject Headings was a new and thoroughly revised version of lists of subject headings compiled by NLM for its bibliographies and cataloging. Frank B. Rogers announced several innovations as he introduced MESH in 1960.
For retrieval, indexing articles and cataloging books and documents, the MESH thesaurus-controlled vocabulary consisting sets of terms naming descriptors is used.
MESH descriptors are arranged in both alphabetical and chierarchical structure. There are 22.997 descriptors and 24.050 see (use) references (ie cross references) that assist in finding the most appropriate, for example: breast cancer use breast neoplasms.

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The current Medline record contains 49 fields. Medline is accessible and available without charge via the Pub Med system. Medline is the database, and Pub Med is the computer system used to access it and the other databases.
Medline on the CD-ROM from year 1950 to current date is in common use in the Institute for Scientific Information in Military Medical Academy of Belgrade for ritrieval, indexing and cataloging books and other documents. In CD-ROM edition the descriptors are explaned by definition of the each term,used for terms,related terms and trees chierarchical display.

MEDLINE BASE RETRIEVAL

Scientific information retrieval depends on different information needs of the users. Fidel and Soergel (5) identify five categories of search request:
- background – the user needs background information on a topic;
- comperhensive – the user needs a complete exposition of the topic;
- discussion – the user needs to know what the prevailing wisdom of a topic area is;
- fact – the user needs to know a specific fact;
- updating – the user as already knowledgeable about a field, but needs to learn whether there have been new developments.

Clinicians and other healthcare providers want a search to be as precise as possible (exact- match) and to include the most relevant documents to their specific need defined with search request. But, as a scientific field grows, its literature becomes increasingly scattered and difficult to organize.The Bradfords law is a phenomenon that occurs when the names of journals with articles on a topic are arranged by how manny articles on the topic each publication contains. In a core journals 33% of a given topic are found, followed by zones of the journals containing an exponential number of articles (n, n2, n3) (4,6).
The first step based on users requests in exact-matched retrieval is selection of the terms for building sets in order to give the user all documents that exactly match the criteria specified in the request (Figure 1).

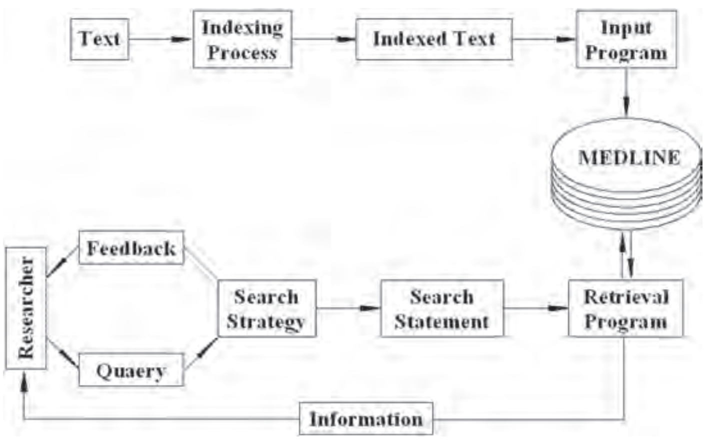

Figure 1. Retrieval process (9)

When the search terms have been selected and subheadings attached, they are combined with Boolean operators And, Or and Not. Also, the explosion operation is an Or of the term exploded with all the narower terms below in the hierarchy (7). For example:

Breast neoplasms Or Breast neoplasms, male Or Carcinoma, ductal Or Phyllodes tumor

Hypertension Or Hypertension, malignant Or Hypertension, pregnancy induced Or Hypertension, renal.

RECALL AND PRECISION

The relevance-based measures of recall and precision quantify the number of relevant documents retrieved from the database (Figure 2).

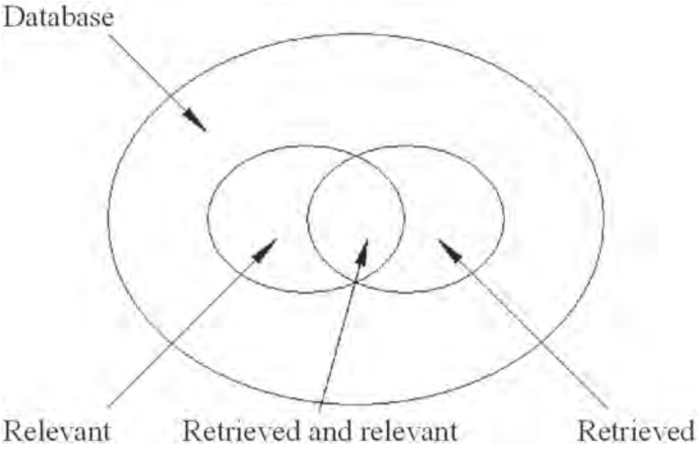

Figure 2. Relevance (4)

Relevance is topical when the part or all topical coverage of the retrieved document overlaps with the topic of the users information need. It is associated with a perception of objectivity, hence reproducibility.
Situational relevance incorporates the users situation into the judgement (8).

INDEXING

Indexing is the intellectual or content-related process of assigning metadata to items in the database to facilitate and make efficient their retrieval.The first indexing procedure is the assignment of indexing terms from a controlled vocabulary or thesaurus by human indexers – manual indexing. The words in each document can be viewed as descriptors of the document content, and the sum of all words that occur in all documents is an indexing language.
In automated indexing the indexing assignements are made by computers. NLM Indexing Initiative investigates the methods whereby automated indexing methods or completely substitute for current indexing practices (9,10).
Analyzing the full text documents indexers search for most precise and relevant descriptors in making document more retrievable. Subheadings, 84 qualifiers to descriptors that can be attached to narow the focus of a term.
Another feature that helps retrieval are check tags, terms that represent certain facets of medical studies, such as age, gender, human or animal, and type of grant support.
Publication type describes the type of publication or the type of study.

CATALOGING

Catalogs and bibliographic databases in the Institute for Scientific Information are searchable by the key words in Serbian from the controlled vocabulary-Thesaurus established at year 1984, based on the descriptors from MESH – controlled vocabulary descriptors, arranged in an alphabetic order. There are more than 18.000 descriptors-key words, and also numbers of cross-references. In the past two years we added more than 3 000 descriptors.
Because in the Institute for Scientific Information is the Editorial Office of the Journal *Vojnosanitetski pregled* and the published articles in the Journal are indexed in Medline base, we use our Thesaurus for selection of the key words in Serbian and English describing the articles content (11).
The annual Index for published articles, authors and key words is classifyed according to MESH Categories and Subcategories.

CONCLUSION

MESH thesaurus, a controlled vocabulary of the descriptors is irreplaceable to researches and librarians for retrieval, indexing and cataloging books and other documents.

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Scopus database as a source for bibliometric information

KEYWORDS: Databases, Bibliographic; Medical Oncology; Bibliometrics; Information Storage and Retrieval

DATABASE SCOPE AND STRUCTURE

In November 2004 Elsevier publishing company announced the launch of the "biggest world indexed bibliography" – Scopus, which includes also the data about the cited references and enables citation analyses (1). Scopus includes about 15.000 indexed resources, 27 millions of documents, 245 millions of cited references, 13 millions of patents and 250 millions of documents on the world wide web. Database has searchable bibliographic references and abstracts of journal articles from 1966 and cited references from 1996. There is about 4.500 journals from the fields of chemistry, physics, mathematics and techical sciences, 5.900 journals from medical science (all journals included in MEDLINE), 2.700 journals from social sciences, 2.500 journals from biological and biotechnical sciences. It does not include journals from humanities. When compared with Web of Science, more than 90% of journals included in WOS are also included in Scopus. The database is also connected with Elsevier's search engine Scirus, so the user can simultaneously search through the database and the web.
Basic search includes title, abstract and kew word search, with the possibility to limitate search for defined disciplines, time span or document type.
Advanced search gives the possibility to use Boolean logic operators and searching with special codes for authors, publishers, journals, references etc.
Author search gives the possibility to search for all publications by an author, no matter of his place on the list of authors of an article. It is possible to exclude the publications of authors with the same surname and initials using the limitators for defined scientific disciplines, journal titles, type of publications and time span. It is possible to save those bibliographic lists using the option MY PROFILES. Very good option is to sort the bibliography ascending or descending according to publication date and to arrange it according to most often used rules for bibliographies – APA, Harvard, Vancouver etc.
The results can be printed, saved on disc saved in MY PROFILES (previous free registration required) or e-mailed to the chosen address.

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CITATION ANALYSIS

Possibility to use links between citing and cited document is considered a very important tool for retrieving the relevant literature on any subject in a database. It is getting more importance every year because scientific research is becomming more and more interdisciplinary all the time. For years, since early sixties last century, the only citation indexes were the indexes produced by Institute for Scientific Information, now ISI Thompson. From fall 2004 there is Scopus as a direct competitor to citation indexes joined in the Web of Science. WOS has a larger database, because it starts from 1945 and Scopus starts in 1965. In 1996 the Scopus catches up with WOS in the number of records added per year, and after 2000 it even adds more records (2). But we may say that from the moment of the emergence of Google Scholar, both WOS and Scopus have a uncomercial competitor, free for use to everybody with the access to world wide web (3).
According to tests performed by P. Jacso (2) about 67% of 27,5 million records of Scopus have abstracts, and about one third of Scopus records have citations (2).
Citation tracker is the option that enables the user to find all the articles in the database that cyte the selected bibliographic list. It is possible to exclude autocitations. Data about citing the selected documents are given in an EXCELL table, that shows the number of citations every article on the list received every year, starting with 1996, and the final score of citations. It is possible to see on the desktop, print and e-mail citation lists for each article separatedly.
It is a good tool for articles published after 1996 and in the journals included in Scopus. For earlier publications the only possibility is to use Advanced Search option and then to search with REFAUTH (author's name and initials). Than the lists received by both search options should be compared, and duplications excluded manually. It is not easy for unexperienced user, so we would recommend that users limit their citation search for the publishing period after 1996.

PRACTICAL SEARCHING EXPERIENCE FROM THE UNIVERSITY LIBRARY

Department for Scientific Information and the development of library system at the University Library in Belgrade was the first library in Serbia that started using Science Citation Index for preparation of bibliometric analysis on demand. Through the great experience we got, we are aware of a lot of problems that emerge when authors from a small scientific community and with different scientific background are compared according to their citedness in Science Citation Index. So we were very interested to compare the results from Scopus with the results from Web of Science, until the emergence of Scopus the only existing citation database. The results (unpublished study by S. Filipi Matutinovic) show that there are obvious differences in scope of those databases, when compared the results of citation analysis for Serbian authors in different disciplines. Web of Science is a database with clear concept of scope, well adapted for citation searching, and the results for different authors from different disciplines are more consistent in WOS than in Scopus. The citation analysis performed with CITATION TRACKER in Scopus is very usefull for authors to get to know who and where used their results for the articles published after 1996. The problem is that if the option in ADVANCED SEARCH for finding the authors in reference lists is used, the results are not the same, and they should be if the database is consistent. The difference is pretty big – about one quarter of citations for the search performed for a Serbian oncologist.
It is known that medicine is better presented in Scopus then in WOS, because Scopus includes the whole Medline database. So we compared the citedness of articles of one Serbian oncologist whose citation bibliography we already made on demand, to see if there is the difference between the results of citedness of his works in WOS and Scopus. The results of the search performed on July 15th 2006, are shown in the Table 1.

Table 1. The results of the search performed on July 15th 2006

Citation Number WOS	Citation Number Scopus -tracker	Citation Number Scopus refauth	Unique citations WOS	Unique citations Scopus	Total citations	Overlap-ping citations
66 (72.5%)	84 (92.3%)	67	7 (7.7%)	25 (27.5%)	91 (100%)	59 (64.8%)

There are six journals included in WOS that are not included in Scopus – *Endocrine Pathology*, *American Journal of Clinical Pathology*, *Human Pathology*, *International Journal of Oncology*, *Journal of Occupational and Environmental Medicine and Food Research International*. Of 18 journals incluced in Scopus that are not included in WOS, one is in Spanish language, one is in Czech, two in French and one in German. The others are in English, but are published by smaller publishers. Database overlapping is about 65%, the result that Scopus has more than 27% more citations than WOS was expected. What was not expected was that there are about 8% of unique citations in WOS that do not exist in Scopus, and that the difference between the number of citations found with the use of Citation Tracker is much bigger than the number found with the use of Advanced Search for authors in references (84 compared to 67).

CONCLUSION

Scopus is a very good database for performing subject search, especially for topics concerning medicine. It is also very good for preparing personal or subject bibliographies according to different bibliographic rules. Citation tracker is a nice tool for tracing connections between different authors, for follow-up of reactions in the literature on published results. For medicine it gives more results than WOS in citation search, but since it is not very consistent for older references and does not include all the resources from WOS we do not recommend it for comparable bibliometric studies.

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Evidence-based medicine available in everyday clinical practice – role of librarian and information specialist

KEYWORDS: Evidence-Based Medicine; Clinical Medicine; Librarians; Information Services

What is Evidence-Based Medicine?

Evidence based medicine (EBM) is medicine based on evidence from everyday clinical practice, concerning both decision making and health care treatment. Although evidence based medicine origins extend back to mid -19 century, it is still a hot topic in modern clinical practice. EBM, as a new approach to achieve the best results in diagnostic and therapy procedures, is supported by world wide famous institutions such as American College of Physicians (ACP), British Medical Association (MBA), the Cochrane Collaboration and U.S. Agency for Health and Quality.

Significance of EBM for clinicians

The purpose of EBM is not to prescribe a practice therapy, in the same way for all patients, but to make clinicians pay their attention to each patient individually. In other words, the practice should be PATIENT-ORIENTED and not DISEASE-ORIENTED. The issue is not only to find "what works" but to provide a treatment that suits best the patient's needs. The patient himself and communication with him becomes evidence on the contrary to the traditional retrieval of professional articles and storage of the most important information. This leads to two basic procedures in reaching clinical data and individual clinical practice.

What does a clinician need?

Criticism has a significant role in clinical practice to "liberate" clinicians from inherited traditional methods of treatment in order to reach realization of a new methods of treatment. Individual clinical expertise is necessary to reach the proper therapeutic method through the communication with the patient. The external evidence is also important, but not always applicable to all patients. Evidence-based medicine must not be oriented only to clinician trials. It also has to involve examination of the best external evidence. It is important how clinicians create questions for patients in order to be able to state a precise diagnosis. The most important is to follow patient's answers, hear their problems (predicaments) and accept them to make proper decision about their treatment with respect for all patients' rights and health care condition.

After communication with the patient, the clinician choose from both – the best clinical expertises and best external clinical evidence. Neither one alone is good enough to achieve the best treatment – care results. Even the most perfect external evidence can be useless without evidence from clinical practices. It can be in some cases even harmful for patients. Selection of the best parts from clinical practice evaluates research.

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ROLE OF LIBRARIANS – INFORMATION SPECIALISTS AND EVIDENCE BASED MEDICINE PRACTICE

Librarians – information specialists in health care institutions have constantly increasing role in searching proper literature. Evidence- based medicine requires filtering-selection of quality information. A librarian faces greater challenge-not to participate in the first part of the process i.e. to offer information, but also identify, select, evaluate and systematize the necessary literature.

EBM offer to librarians a chance to accept the new role with all their knowledge and skills and so become an essential and precious assistant to clinicians. Nowadays, the reading (following retrieval) of up-to-date (recent) papers from the best clinical practice available on internet-medical databases and online data sources. The advances-development in medical research is constantly present, so actual and numerous databases are precious and rich resources of medical investigation – research.

Librarians in health care institutions become also educators, who should teach medical staff, as well as students, how to get fundamental and advanced skills in medical base retrieval.

Numerous congresses and workshops are organized all over the world in order to offer education in evidence based medicine to both librarians and clinicians. They learn how to use all available resources and enable free access to EBM articles of journals and books from up-to-date clinical practice in medical bases.

Such work shortens the time needed for retrieval of many articles that could be useful and time consuming without any benefit.

The new retrieval method for the best evidence requires constant education for librarians-information specialists, including improvement and skills in internet retrieval and knowledge of medical terminology. In this way, the retrieval process can be short, valuable and, of course, useful to the maximal extent.

Librarians have to develop evaluate and make more accessible information tools to support Evidence Based processes.

If librarian find a right tool, he will provide a quick answers to clinical question.

Online tools (databases) have to be selected so that they can make clinical decision faster and provide higher quality patient care.

EVIDENCE-BASED MEDICINE RESOURCES INCLUDE:

- *Cochrane Database of systematic Reviews*

Arguably the most extensive collection of systematic reviews.
By Cochrane collaboration Experts of 40 clinical specialties

- *American Family Physician By American Academy of Family Physicians*
- *SUMSearch*

A search engine that gathers evidence-based clinical information from MEDLINE, DARE and the National Guideline Clearinghouse.
By University of Texas Health Science Center

- *FIRSTConsult*

A database of evidence summaries drawn from Cochrane, Clinical Evidence, the National Guideline Clearinghouse and others.

by Elsevier

- *National Guideline Clearinghouse*

Comprehensive database of evidence-based clinical practice guidelines.
By Institute for Clinical Systems Improvement

- *The Database of Abstracts of Review of Effectiveness (DARE)*

By the NHS Centre for Reviews and Dissemination

- *ACP Journal Club*

By the American College of Physicians

- *Clinical Evidence*

A compendium of systematic reviews, gathered from Cochrane, MEDLINE and other sources, updated and expanded every six months.
By BMJ Publishing Group

- *Definitive Controlled Trials*

CONCLUSION

Role of information specialist in supporting Evidence-Based Medicine is that they should constantly educate themselves with

- training how to cooperate with clinicians,
- training in information resource access and information skills,
- develop in medical knowledge – to be involve in medical specialties,
- to develop critically analyzed topics in order to offer maximal support to evidence based medicine.

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