

## **Medical library as an intellectual support for users**

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### **Abstract**

The values generated indirectly as a result of the intellectual support provided to scientists in their research play a key role in the activities of medical libraries. The body of knowledge assembled by the library, its availability and dissemination, as well as the use of other libraries' collections, form the basis of the functioning of medical libraries. However, the overriding goal of the library's multifarious functions is to develop new scientific content, ideas and initiatives.

The skills of librarians in supporting educational and research processes, inspiring researchers and providing them with useful advice is extremely helpful, especially in institutional libraries specialized in a particular field of science. Librarians are expected to possess knowledge in given fields of science, to be well acquainted with current areas of research and the terminology used, and to be able to check on current research findings reported by scientific centres all over the world. Confidence in librarians' skills to be creative in supporting scientific circles is being developed through rapid reaction to the information needs of research workers and close cooperation and openness when working with libraries' users.

The information resources of the Nofer Institute of Occupational Medicine (NIOM) Scientific Library are based on its traditional collections, an electronic collection of journals, books and data bases accessible via the Internet or on stationary computers, as well as broad and efficient inter-library cooperation in Poland and abroad. Appropriately classified collections tailored to research also allow libraries to undertake additional tasks useful in the advancement of a given scientific area.

This paper discusses the role of a specialized medical library with particular reference to its provision of intellectual support. The activities of the NIOM Scientific Library (e.g., SCOPUS-based bibliometric studies of biomedical journals, MEDLINE data base analyses in view of its utilization in research, the share of Polish publications in the world medical bibliography, analyses of occupational medicine development, studies of international character of research works) are used as examples.

### **Introduction**

Already in ancient times, the ability to read and write was the key to power and wealth. In Babylonia and Assyria, teachers of writing and scribes formed an aristocratic social class sometimes even more powerful than courtiers or rulers themselves. In old China, books were destroyed and burned to enfeeble opponents and to inhibit cultural development. Due to the prudent policy of its rulers, the ancient city of Pergamum achieved prosperity and a high level of culture. After Alexandria it was the second most important centre of science, culture and Hellenistic art. The Library was its symbol. The rulers of Pergamum tried to ensure their scholars a relevant research setting in the form of books. Books were often brought as valuable spoils of war. They also captured available manuscripts before they could reach competitive libraries in Alexandria. The main premises of the library were used as a fine hall where receptions and scientific meetings were organized. In ancient Rome, the homes of more distinguished Romans had to be equipped with impressive libraries arranged fashionably, depending on their owners' affluence, to bestow splendour on the family. The idea of establishing public libraries participating in the cultural life of all well educated citizens was born there. Since then libraries have served as an instrument promoting cultural values.

### **Medical libraries in the information culture**

The library has become an institution that disseminates the achievements of human thoughts and ideas documented by records presented in different forms. The means of conveying ideas change, but the goal remains the same: the gathering and ordering of the collection of certain documents becomes a means of human communication.

A modern library is based on the coexistence of varied forms of communication. In the past, the value of a given library was represented by its own collection of books, nowadays owing to the Internet, the library can offer along with its own collections access to multifarious sources of knowledge assembled anywhere in the world. Information provided by a library itself becomes a value. The virtual environment creates the possibility of accommodation to the user's needs. Still more sophisticated instruments of programming and user interfaces facilitate the use of broad sources of information to meet the expectations of the recipient. However, the more the communication facilities, the greater risk of information noise. That is why a librarian in a scientific library becomes a guide and a navigator and can also analyse and manage the knowledge provided. A library is an organization that utilizes knowledge in the most intensive way possible. The higher the level of information culture represented by the library, the greater the information support attained by the user. The library culture is manifested by particular care with information, respect for information treated as intellectual property, openness in the communication system, the rapid acquiring and processing of information, elimination of information noise, use of numerous sources of information and its dissemination [1,2].

Librarians should possess the skill to use and interpret properly information terminology and terms as well as information derived from other sources. Specific, non-material sources of information impart a unique character to medical libraries, and the information culture inextricably connected with efficient information makes the library a place where ideas are exchanged and an active approach to science is stimulated [3].

### **Intellectual basis for science**

Scientific libraries specialized in particular fields have been established to make sources of information available in a given area. The collection and storage of books are ancillary tasks, since the body of information and the skills to use it are much more important. The major goal of specialized libraries is to support scholars in creating new content, ideas and research initiatives. A user deciding to go to the library or entering the library's web site is searching for information needed for creative activity in a given field of science or for solving a problem faced in his or her research work. The efficient use of acquired knowledge depends greatly on the support provided by the library. A researcher is focused on the particular field of science, whereas the search for references, however important, is a secondary issue. Being provided with broad access to information, the problem faced by the researcher is to synthesize the available knowledge and draw out the most essential content. That is why the skills of librarians to advise, inspire, and assist in investigation processes are so helpful. In a medical library, there is an opportunity to integrate medical knowledge with broad sources of general knowledge.

### **The role of medical libraries in the advancement of science**

Bearing in mind the chaos and transience of vast stores of knowledge available from modern electronic media, librarians need to develop additional skills to manage information, as well as to search, clarify, and assess the quality of information [4]. The quality of information services in a medical library should correspond with the expectations of the scientific milieu it serves. Nowadays, two groups of researchers can be distinguished, those who foster traditional forms of services who are "helpless" in the face of electronic media and those who are "electronic-liberated" and whose informative-retrieval competences are developed independently of the library's assistance [5]. Nevertheless the conditions in which library services are provided — starting from traditional ones provided on the spot through the

global range of electronic retrieval of information — are essential for both groups. A librarian not only ensures access to given resources, but she/he is also able to assist in problem recognition and respond to queries or to suggest where solutions can be found. Although researchers are not frequent visitors to a library, they are now more active readers since electronic sources of knowledge and electronic communication with the library are their major information channels.

The computerization of information services and universal access to knowledge, including medical science, carries considerable risk of a superficial approach to many research problems. Informality of the media, mass communication, a uniform vocabulary, and the use of ready-made formulas in retrieval systems frequently verge on the cliché and they do not lead to innovation.

Recognizing the diversity of research problems and the exploration of issues requires reliable, evidence-based medical knowledge. A modern medical library, recognized as a knowledge-based institution, constantly develops, educates, and actively participates in the process of the continuous advancement of the information and communication abilities of its users. This is a response to dynamic changes in the library environment, intensification of information and communication processes occurring in the world of science and education, and the different needs of users [6,7].

### **Specificity of small medical libraries**

In the era of information — also called the era of knowledge — in which both information and knowledge form its source, neither the number of borrowed books and publications, the statistics of visited web pages nor the number of full texts of publications collected from the data base, but the usefulness of the information provided for the development of scientific research is an essential characteristic of any scientific library, something that is very difficult to measure or express directly in numbers or rates. The assistance researchers receive in the medical library results in new research initiatives, the creation of research centres, expert consultancy, and — most essential — the opportunity to track worldwide progress in medical science. The major value of small institutional libraries is their closeness and readiness to meet their users' needs. Well selected, specialized collections as comprehensive as possible and assured access to external, reliable sources mean that a small library can contribute to the development of a given field of science. Such a library should provide the broadest possible offering in a given specialization and cooperate with larger libraries. The smaller the library, the greater the importance of the role of liaison between other libraries and access to electronic datasets. A library, small but well equipped with up-to-date electronic services, may become an important intellectual centre.

### **Librarian in a specialized library**

The well selected collections of specialist libraries are more often and better used than collections representing general knowledge. A small library is less formal and the librarian has closer contact with its visitors. In direct relations with the user, it is much easier to become familiar with the specificity of the visitor's interest and to assist him/her in obtaining relevant sources of knowledge. To support the cognitive processes of scientists, librarians should be familiar with state-of-the art techniques of providing information and knowledge and ensure rapid, efficient and reliable retrieval. In the institutional library, the librarian knows the subjects of research currently being carried out, becomes familiar with new biomedical terminology, and knows a wide range of publications in a given area. He or she is

able to advise on the quality and status of scientific journals, specialized data bases and Internet services, as well as to participate in the establishment of the library's own data bases, thematic services and area repositories. In addition, the librarian should possess relevant academic, social, cultural, and technological knowledge in the area of management and information services 'tailored to the needs of the host institution' in which the library operates, as well as general knowledge of the history and culture of the local community, region, and country, which enhances the prestige of the profession of librarian.

In small institutional libraries, the librarian's skills to support educational and research processes and initiatives are of special importance. The librarian is expected to be familiar with a given area, research subjects, and terminology and to be able to check on current findings reported by research centres from all over the world. Confidence in librarians' skills to be creative in supporting scientific circles is developed through rapid reaction to the information needs of research workers, close cooperation and openness when working with libraries' users, and involvement of librarians in activities related to a given field of science.

### **The Scientific Library of the Nofer Institute of Occupational Medicine**

The origin of the NIOM Scientific Library goes back to the year 1945. The development of science and growing private collections of the doyens of Polish toxicology, work hygiene and industrial medicine provided a strong impetus to its establishment. The identification of health hazards related to the dynamic progress of industry and diagnostics in numerous areas, including toxicology; and a growing interest in the health of workers and work-related health effects gave birth to the idea of collating knowledge from this specialized field. The essential aim of the Scientific Library is to create the basis for easy access to specific fields of occupational medicine understood in its broadest sense, including work-related health hazards, toxicology, work hygiene, occupational diseases, psychology, sociology, epidemiology, environmental pollutants, and health care organization. The major group of its users comprises the Institute's research workers, and specialized publications collected in the Library provide information about the most up-to-date Polish and international research methods and trends in the area of occupational medicine. The employees of the Scientific Library have become involved in research programmes through their participation in conferences organized by the Institute, the establishment of reference bases covering the literature concerning occupational medicine, subject analyses of data bases, checking on new research trends and directions. Because of the knowledge of subjects being investigated in the Institute and the specificity of scientific vocabulary used, understanding researchers' information needs is much easier. The main roles of the librarian employed in a specialized library are to advise and suggest to researchers where they can find the literature required, how to select key words, and what retrieval techniques to use in individual data bases to obtain the information and materials desired. A good knowledge of the specialized area and skills and abilities acquired in the information domain facilitate the undertaking of additional tasks supporting the activities of the Institute.

### **Examples of work at the Scientific Library of the Nofer Institute of Occupational Medicine**

The NIOM Scientific Library may be taken as a good example of the intellectual role and activities of a specialized medical library. Its tasks comprise bibliometric analyses of the managed data bases, analyses of the share of Polish publications in international information services, analyses of the progress made in occupational medicine and the international character of scientific research.

### Example 1.

The quantitative analysis of references collected in data bases: MEDLINE-OEM, CISDOC, HSELINE, NIOSHTIC, and MEDIP.

Bearing in mind that scientific research must have clear reference to the existing scientific literature, the Library attempted to assess the development of occupational medicine based on reports and findings published in scientific journals recorded in bibliographic data bases. To this end, a model of thematic classification was developed in the area of occupational medicine regarded as a field of science that integrates other branches of science. This model was used in the quantitative analysis of references collected in data bases, such as MEDLINE-OEM, CISDOC, HSELINE, NIOSHTIC, and MEDIP (Fig. 1).

Model of occupational medicine studied as a field of science:

- Occupational hygiene
- Toxicology
- Occupational pathology
- Epidemiology
- Physiology, ergonomics, psychology and occupational sociology
- Health care organization
- Environmental risks

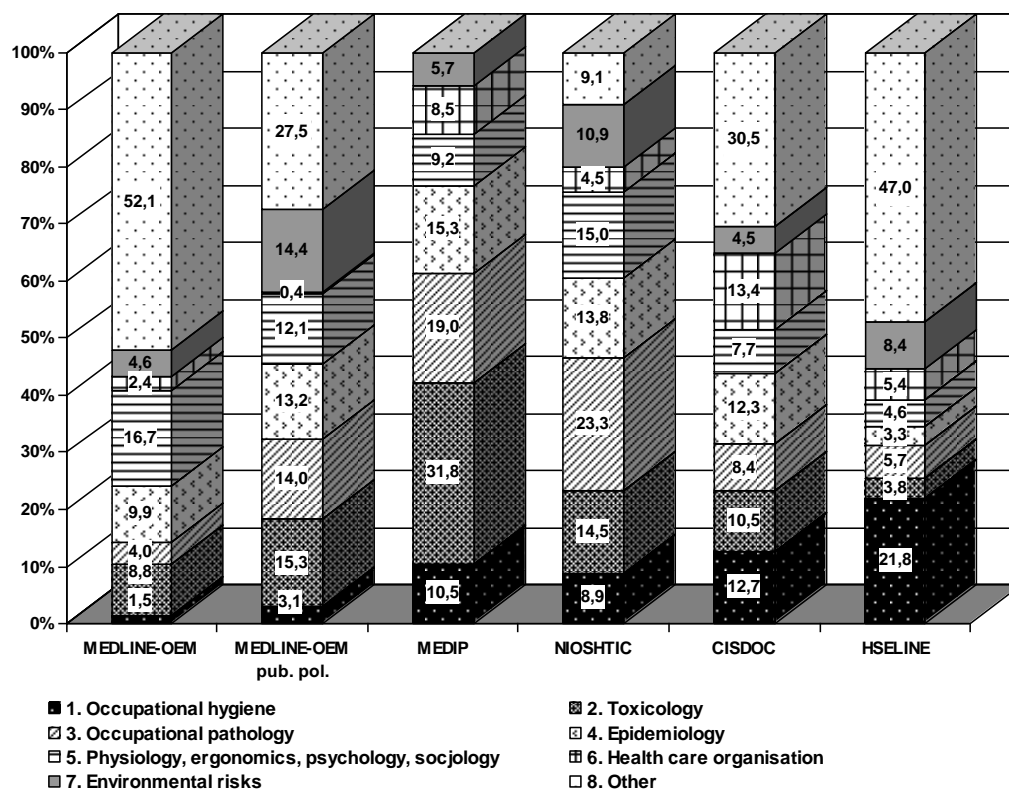
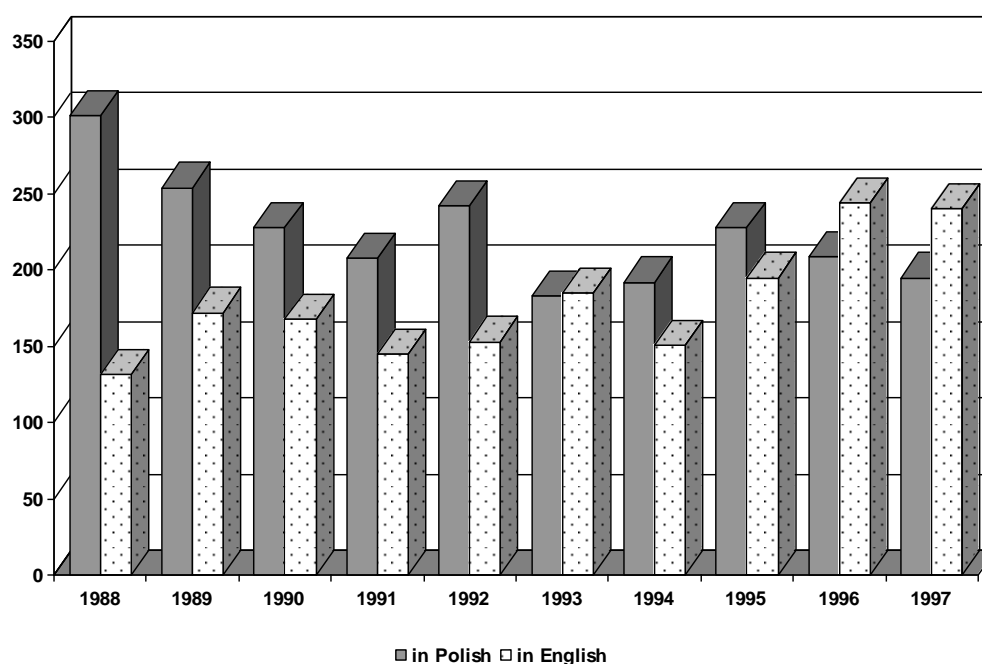


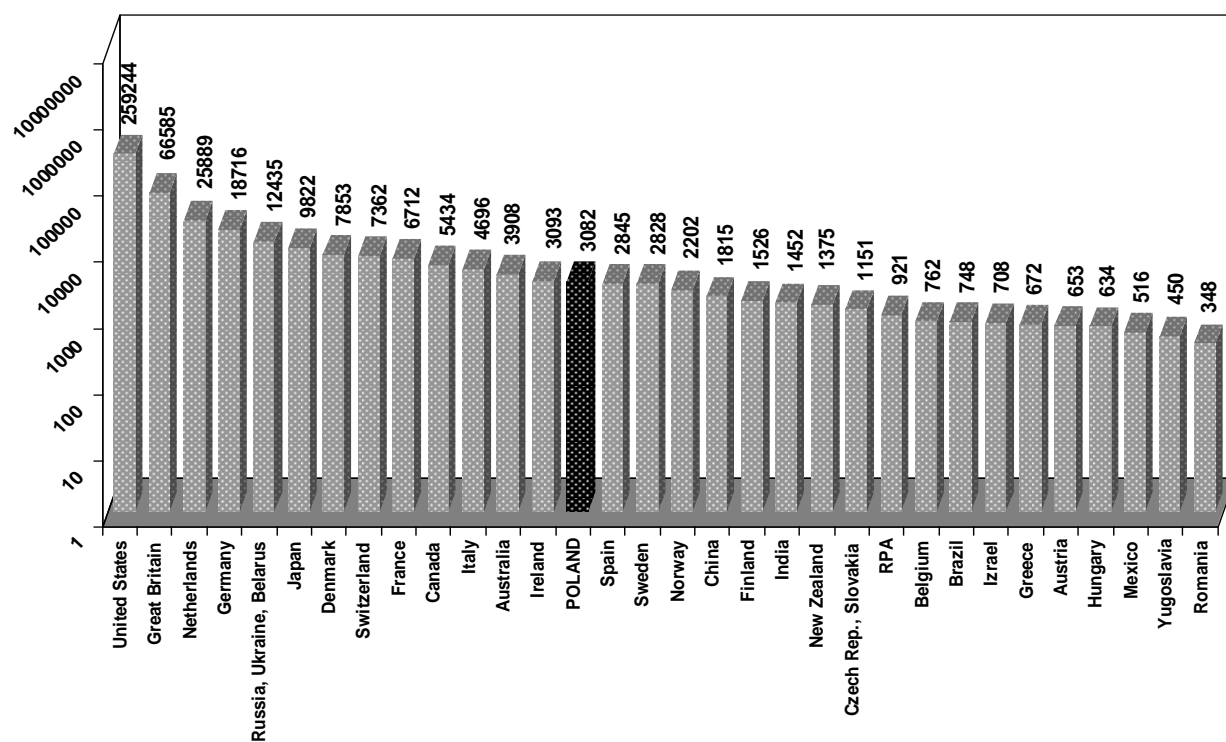
Fig. 1. An analysis of the research documented in bibliographic databases.

### Example 2.

The contribution of Polish literature on occupational medicine to the worldwide information (MEDLINE-OEM base) (Fig. 2, 3).



**Fig. 2.** Language of Polish publications in the MEDLINE-OEM base.



**Fig. 3.** Country of publication in the MEDLINE-OEM base.

### Example 3.

Identifying Polish and foreign journals in the field of occupational medicine (MEDLINE-OEM base).

Title of the journal	Language
▪ International Journal of Occupational Medicine and Environmental Health	Eng
▪ Medycyna Pracy	Pol
▪ Bulletin of the Institute of Maritime and Tropical Medicine in Gdynia	Eng
▪ Annals of Agricultural and Environmental Medicine	Eng
▪ Przegląd Lekarski	Pol
▪ Polski Merkurusz Lekarski	Pol
▪ Roczniki PZH	Pol
▪ Wiadomości Lekarskie	Pol
▪ Przegląd Epidemiologiczny	Pol
▪ Pneumonologia i Alergologia Polska	Pol

**Fig. 4.** Polish journals of occupational medicine.

Title of the journal	IF
▪ Occupational and Environmental Medicine (British Journal of Industrial Medicine)	1,681
▪ Journal of Occupational and Environmental Medicine (Journal of Occupational Medicine)	1,671
▪ American Journal of Industrial Medicine	1,280
▪ American Industrial Hygiene Association Journal	0,766
▪ Scandinavian Journal of Work, Environment and Health	1,708
▪ Archives of Environmental Health	1,226
▪ Contact Dermatitis	1,130
▪ Toxicology and Applied Pharmacology	2,184
▪ Aviation, Space and Environmental Medicine	0,537
▪ Environmental Health Perspectives	2,119

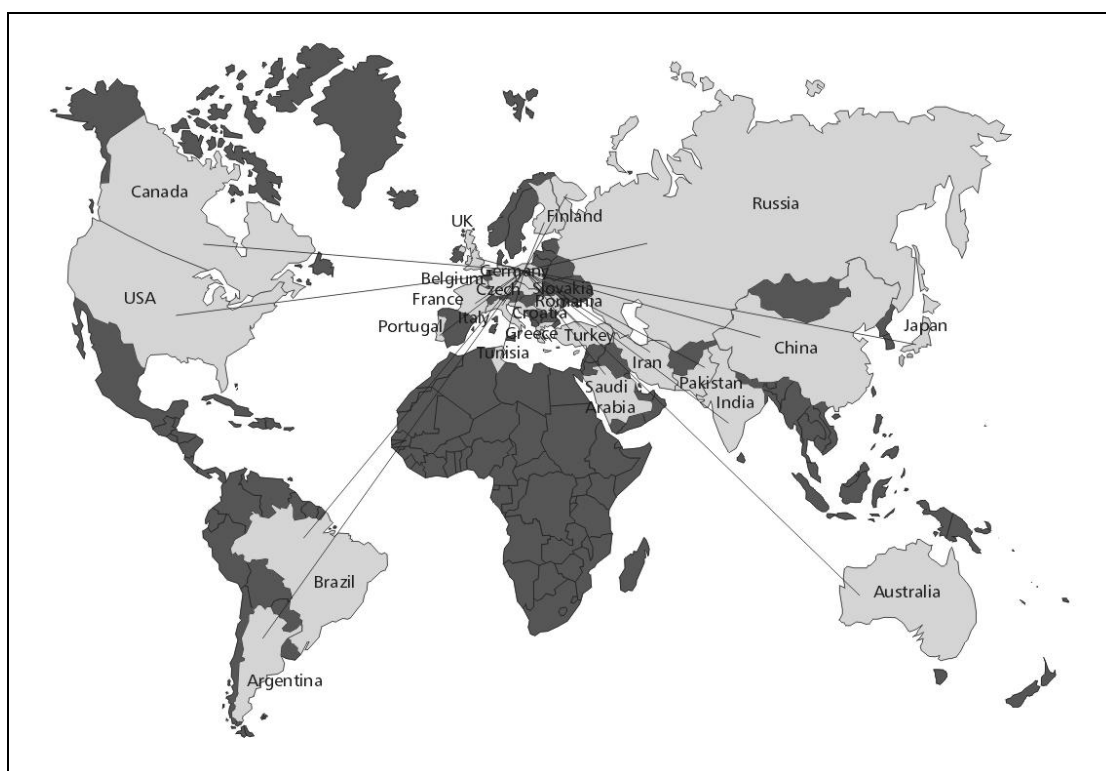
**Fig. 6.** Foreign journals of occupational medicine.

### Example 4.

The transfer of knowledge exemplified by the SCOPUS-based analysis of citations of the Polish journals *International Journal of Occupational Medicine* (published in English) and *Medycyna Pracy* (published in Polish with English abstracts) [8–10].



**Fig. 6.** The impact of the *International Journal of Occupational Medicine* (based on most frequent citations).

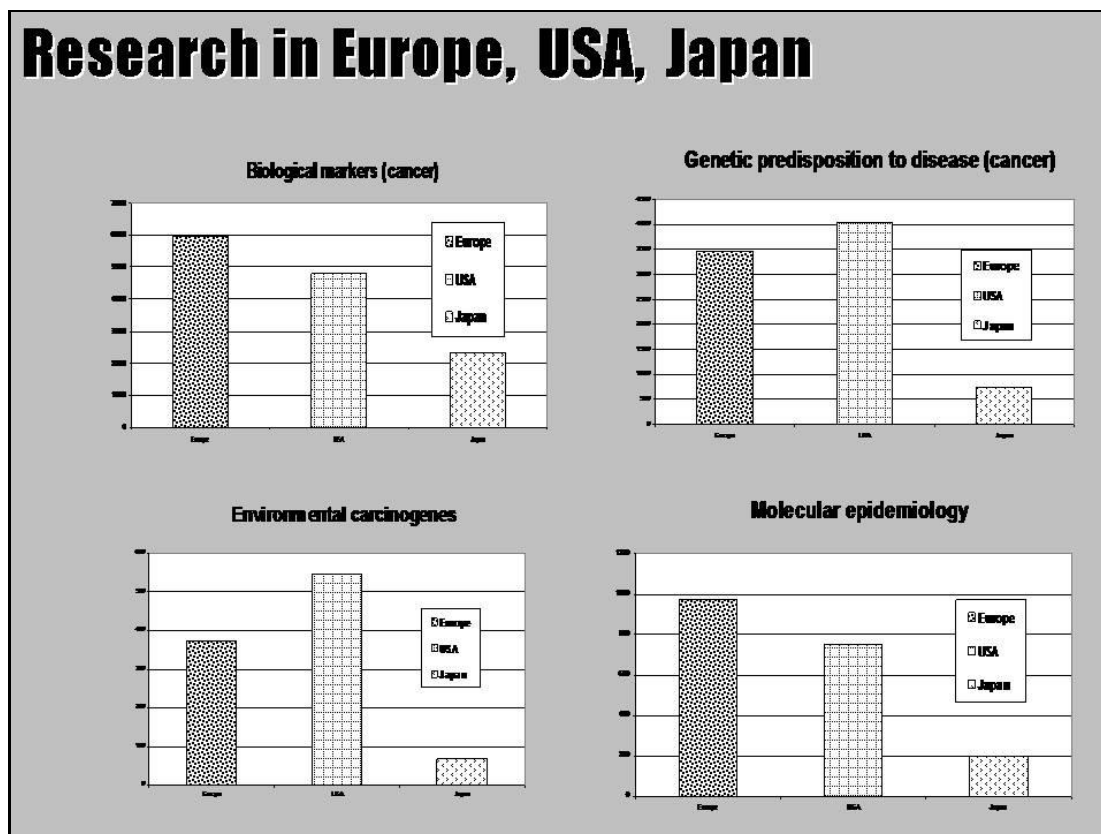


**Fig. 7.** The impact of *Medycyna Pracy* (based on most frequently cited articles).



### Example 5.

A quantitative analysis of publications in PubMed on a given subject (biomarkers, genetic predisposition to disease, environmental carcinogenesis, molecular epidemiology) carried out in Europe, the USA, and Japan.



**Fig. 8.** A quantitative analysis of publications in PubMed (2006).

### Conclusions

How can intellectual support for the users of a specialized medical library be measured? There is no unequivocal answer to this question as formulated. One indicator may consider new values emerging in the course of the library's functioning. They include (among others) the stimulation of users' cognitive processes, the development of skills to process information creatively rather than mechanically, the creation of new ideas and the search for their interrelations, and the ability to perceive interactions and relationships between certain types of knowledge. In the terminology of economics, "added value" has been used to define the increase in material resources. Non-material resources, however, are difficult to measure. Sometimes this increase is denoted as "library-added extra value" [11,12] and comprises all values generated in the library as a product of human intellectual thought and effort. The intellectual assistance received in the library gives an impetus to deepening medical knowledge, and also to create substantial wealth out of non-material knowledge, recognised since ancient times as making libraries places of particular significance.

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