



The Purpose of Scientific Journals: Small Is Important

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People rarely think about the purpose of a scientific journal. The authors look for the place to publish their scientific work, caring mostly for the databases in which the journal is indexed, its impact factor and own academic advancement; while the editors are burdened with everyday problems of their work, troubles with peer review, catching deadlines, and finances. But, what is the purpose, the basic reason for the existence of a scientific journal, particularly in a small scientific community?

At first glance, the answer is simple: the purpose of a scientific journal is to provide information about new research results, supported by relevant, strong and comprehensible proofs for its reliability. This statement, however, opens a number of more delicate and more difficult questions such as: Why some journals are better than others?, What about the use of local languages?, What about specificities of a journal's environment (economic, political, social, cultural)?, If a journal cannot be of top quality, why publish it at all?

Starting the Croatian Medical Journal, a small journal from a small country,^{1,2} we asked ourselves such questions³ and invested a lot of effort in the search for answers that would satisfy our doubts,⁴ friends⁵ and enemies.⁶ The answers that we offer are not necessarily the best or even correct, especially in different environments and for different journals, but they are based on the success of 15-year experience and hard work.

The purpose of a journal can be analyzed from the standpoint of interests of science, of the authors (scientific community), and of the environment/society in which it is produced. All three can be narrowed down to a single and simple cause: by running the journal well,^{7,8} its editors have a powerful tool of education,⁹ which ultimately may improve the care for the patient.¹⁰

Journals and Science

Science has four essential qualities: 1) it is the source of genuine human knowledge, 2) it is one of the key

components of the educational system, 3) it is a part of culture of a particular community, and 4) it contributes to the general well-being and safety in everyday life. All verifiable and applicable knowledge has been gained by means of scientific method. Scientific knowledge is further transformed into a concrete product, which makes life longer and easier. This is known and clear to every scientist, but three of the listed attributes of science are particularly important for economically less developed countries.

The first is the educational role of science. During their career, scientists pass through a very special school in which they, beside gaining knowledge on their particular line of interest, learn the virtues of science. When the results of research are in the process of publishing, all its parts are subject to strict judgment, and when the research goes through the reviewing process and is made public, it is analyzed, repeated, and criticized by scientists from all over the world. The scientist learns to accept well-founded criticism and other researchers' opinions. This process fosters honesty and modesty: honesty because the system makes cheating difficult and modesty because other scientists discover the mistakes and imperfections they themselves failed to see. Science thus produces good teachers who are guided only by the results of their work and are willing to continuously assess the quality of their work, teaching younger colleagues scientific principles and way of thinking. Science produces teachers who do not feed their students with dogmas and empty phrases, metaphysics, mysticism, and slogans. The scientist-teacher knows the limits and the accuracy of what he or she teaches, knows when to replace old and obsolete facts and accept new ones (Mohr H. Lectures on structure and significance of science. New York-Heidelberg: Springer Verlag; 1977).

The second important attribute of science is its cultural role. Culture encompasses everything material and spiritual that people have created, and science significantly contributes to both of these spheres. Scientific work increases scientists' knowledge and abilities. Scientists invest their knowledge into the pool of cultural wealth of the whole humankind. In this way they both increase that pool and have the knowledge

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of other scientists at their disposal. Therefore, scientists are those who can, in the fastest and most effective way, include their community into the international distribution of knowledge and work. Scientists receive and exchange information indispensable for technological and cultural development of their community. Scientists' knowledge and scientific way of thinking are necessary for decision-making in every sphere of life.

Finally, the third attribute of science is its contribution to prosperity and security. Although sometimes even a half century may pass between a discovery and its implementation, all discoveries sooner or later enter everyday use. The range of activities between the basic research and implementation of a new product is called the innovation chain (Marusic M, editor. Principles of research in medicine. 1st edition. Zagreb: Medicinska naklada; 2008). It comprises three phases: basic research, development research, and new product. In medicine, the phases of innovation chain are less visible than in other fields, primarily because of the longer time lag between the discovery and implementation, since not only the efficiency but also safety of the product needs to be examined.

Journals and Authors

Some physicians say that a good physician does not have to be interested in science; it is enough that he or she successfully treats the patients. However, the modern paradigm of evidence-based medicine expects from physicians to be able to understand and critically assess research results from complicated clinical trials.¹¹ A modern physician should thus have knowledge of research enterprise and assessment of best evidence in answering a clinical question because his or her approach to each individual patient is scientific. The best way to acquire research skills in addressing clinical questions is to get involved in research and publish in medical journals. This is where the educational role of journals becomes important in small scientific communities and countries.¹²

Another reason for the need to publish your own work in medicine is the fact that knowledge is the property of the whole mankind. In its heroic effort to treat the ill and disabled, mankind unites all its medical knowledge. This integration is necessary because thus it becomes greater, open to comparisons, critique, and improvement; unnecessary research of already known facts is avoided, and it enables the weakest to learn from the most knowledgeable. Medical knowledge cannot be limited, simply because there is no limit to diseases and because for a physician the benefit of the patient is the priority (Thomas L. The youngest science: notes of a medicine-watcher. Oxford: Oxford University Press; 1984).

The knowledge of mankind is united by means of communication, and the greatest part of this communication

takes place within the network of scientific journals. Communication requires a common language, which has become the English language in medicine and in science in general, owing to non-medical circumstances. This is the reason why many national medical journals indexed in the most important medical bibliographical database Medline/PubMed change their language into English.¹³ We will here advocate changing the language of small journals because national journals in the national language and national journals with the international languages serve in different ways the same purpose: to educate the scientific community and build up the critical mass of researchers and research results to join the global mainstream scientific community.¹⁴

All those who have had their articles published in respectable journals automatically have a precious, albeit often a painful, experience that their work, ideas and presentation of data have passed through a merciless scrutiny of the best experts for the given medical field. The editors, on the other hand, look for important and original messages, as well as deep understanding of the subject, originality and topicality of the hypothesis, importance of the findings, power of the methods, strength and clarity of the arguments, and frugality and prudence of data interpretation.

Finally, the number and quality of scientific publications of a single researcher, institution or country is the best documented proof of its scientific activity.¹⁵

Journals and Society

Science belongs to the entire humankind but it still needs the national framework for individual researchers. The relationship between science and national interests is even more complex when considered from the point of view of small nations and less developed countries. This is because science is an activity that yields discoveries, and these discoveries, in the process of innovation, through patents and development of technology are transformed into products that can improve not only the quality of our everyday life but increase economic and political power. Although it is most probable that scientists from a small and less developed country will not make many cutting-edge discoveries, for small nations, the fastest route to advancement, progress, and joining the integrations of developed countries is through the development of science. Scientists are those who can most easily receive knowledge from the mainstream scientific community and pass it on to the younger generations. In other words, scientists are the best students and best teachers.

True progress and reputation of a country can only be achieved by true values, that is, products of human mind and hands. Spiritual and material progress can only be achieved through knowledge and the basis of knowledge is science. Scientific articles are read by scientists from all over the world, so every local contribution to the world's science



increases the reputation of the country of its origin. It also increases the reputation of the scientists themselves, who should become those who set the standards for an evaluation of their community.

How then to catch up with the more developed scientific communities? First of all, it is important to value and promote science at the national level. Although research and development are priorities of most enterprises, including individual countries, promotion of science as the highest national priority is most important for smaller countries. The promotion of science has to be founded, first of all, on pride and self-respect of the scientists themselves, on understanding of its national significance, and, finally, on communicating the importance and benefit of science to the public.

The lack of financial resources is often an excuse for scientists and politicians alike to justify the poor position of science in their country. It is true that scientific work has to be supported with considerable financial means, especially since most research is highly expensive. It is no less important that scientists are well paid, if for no other reason but for their self-respect (otherwise they are in danger of indulging in self-pity), so that they would not have to leave science, or spend their time on searching for part-time jobs. Investing in science is also important for the sake of attracting the best young minds. However, the lack of money is not the main obstacle to the development of science. Scientists in a small country do not have to engage into expensive research. In every branch of science there are issues and areas where research is not that expensive, but may be important for the global scientific community. It is not important what scientists do but that they do it well-the value of scientists does not lie in the field of research but in the quality and results of their work.

The only way for a small country to break out of the vicious circle of scientific inadequacy is to introduce and follow the best scientific principles and quality criteria and increase the critical mass of competent researchers. The latter implies the education of finest young scientists at research centers in developed countries and their return to the national scientific community.¹⁶

Visibility of small journals

Publishing in scientific journals with international peer review process is a part of fostering research in a country. Such a journal may be a national journal with international visibility. How can a national journal gain international visibility? There are many ways, but here we focus on the approaches that worked well for our journal to reach out from the scientific periphery and its vicious circle of inadequacy and invisibility.¹

The most important advice we can give to an emerging journal or a journal striving from more visibility is to

define its niche-journal specificities that will make it unique in the global scientific community. A new journal, especially from the scientific periphery, cannot rely on the idea that it will publish better or more original work than mainstream, already established journals. Thus, the first step of considering establishing a new journal is to find its place, its specific niche in the scientific world and then build its profile, all its features accordingly. Small journals should seek their chance, even advantages, in the specific areas and ideas, needs, environmental characteristics, even social and political specificities of the region they represent. In other words, local problems, even if they are as painful as war, can be sources of precious knowledge for all mankind.¹⁷

This was our experience when the release of the Croatian Medical Journal coincided with the outbreak of the war in Croatia and then in neighboring Bosnia and Herzegovina in 1991. We were aiming to publish a typical general medical journal but the war did not leave other options to us as physicians but to document as best as we could the medical aspect of the war, from the war atrocities to psychosocial trauma of the population. Working with our colleagues we learned that they had enormously important knowledge that needed to be shared with the global medical community, but that they did not have skills in data presentation and scientific communication.¹⁸⁻²⁰ This determined two major specificities of our niche: 1) to specialize in the social aspect of medicine, from public health to forensic DNA identification of missing persons, and to 2) primarily work as educators of our authors.⁹ Education has remained our primary activity to this day, when the Croatian Medical Journal is a respectable international journal-the first in the history of all Croatian scientific journals to reach an impact factor greater than 1. Our authors, friends, supporters, owners and financiers often ask us when we are going to have an impact factor over 2 (and why we don't have it already!). Our answer is simple-it is more important to work with the authors from a developing country to present important health research from their country. We know such article will not bring citations, but the Croatian Medical Journal is recognized valued for its presentation of best health research from developing and emerging countries. Journal's author-helpful policy, where we work with the authors on the quality of data presentation and writing even before the article has been submitted to the journal, has required a considerable amount of work, but it has paid off by the increase in the number of submitted papers,²¹ increased popularity of the Journal in targeted scientific communities,⁸ as well as our authors' increased awareness about the importance of reporting research and scientific communication skills.¹⁸

Journals and Editors

As journal editors of small journals are most often respected

academic figures in their communities, we successfully negotiated the introduction of a mandatory course in Croatian medical schools on scientific communication and evidence-based medicine.¹⁸ This we see as the best way to build up a critical mass of young researchers by concentrating on our future, not only current authors.

Our war experience has also thought us that editors can contribute to peace building in the region. The journal participated in humanitarian²² and peace-promoting activities²³ and published more than 100 articles on war medicine, casualties, organization of health care during the war, public health issues in war and "peace through health" concepts.^{24,25}

We also used theme issues, especially in collaboration with other journals in the world, to promote the journal and increase the visibility of research from small scientific communities.¹⁸ Theme issues are a good way to mobilize researchers and get many high quality submissions to the journal.

Editors of scholarly journals from small countries are researchers themselves, and we used a research approach to our work in the journal, investigating different aspects of its work. In this way we not only published a number of articles in international journals but also gathered evidence about the journal to plan for its future development. Our research also helped us to introduce and promote responsible conduct of research, good publication practices,²⁶ as well as transparency of clinical trials.²⁷

Finally, we learned that it is important to provide a legal framework for the functioning of the journal, especially the editorial independence. Like many small journals, Croatian Medical Journal was started as an enthusiastic effort of a small group of people with a vision for better medical science in the community, without any commercial or legal regulation of its work, or even any formal owners. After several cases of disputes over editorial independence and sacking of editors of major international journals, we also asked ourselves who would hire or fire us.²⁸ Drawing from the experience of most prominent journals, such as JAMA and New England Journal of Medicine, we worked together with legal experts to draw the Agreement on the Croatian Medical Journal—the binding contract of all four Croatian Medical Schools, which we identified as our owners, to ensure independence of editorial work and good editorial practice as defined by international editorial organizations.²⁸

Conclusion

It is easy to start a journal, even in a small country, but it is hard and almost impossible in a small country to make it into a successful and important voice in the global scientific community. However, the work invested in a journal is not wasted because it stimulates research and culture of scientific

communication. Our advice to editors of small journals is to learn about the profession of scientific publishing, stay informed about new developments in scientific communication and good publication practices and serve as teachers in their community.

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