For free or for fee? Dilemma of small scientific journals

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Biomedical publishing is becoming increasingly dominated by multinational companies, advertising research articles at the international market, presenting them electronically through web-based services, and distributing them to readers-consumers. It seems that they will soon become the sole publishers for the majority of biomedical journals. In the past decade, however, we witnessed a quiet revolution in the whole structure of scientific communication, influenced by new technologies and initiatives such as Open Access, PubMedCentral, PLoS, and BioMedCentral.

The *Croatian Medical Journal* (*CMJ*) has recently been approached by two major publishing companies and offered to become one of the journals in their cluster. The five benefits offered to the journal were the following: increasing the journal's international market presence; working with the editors-in-chief and publisher's academic relations on the improvement of the impact factor of the journal; copyediting and typesetting via publisher's offices; marketing for subscription and non subscription revenue and paying royalties on the revenues received by publisher to the present owner of the journal; and input marketing to attract papers. These offers prompted vivid discussion among the members of the journal's Editorial board. The comments received from many scientists related to the journal made us realize that the decision on this matter was neither simple nor straightforward. The editorial decision was to join neither of the publishers. We felt that the decision had to be explained to our readers by defining *CMJ*'s position in global scientific and medical journal publishing. Our experience may be similar to that of the many biomedical journals which find themselves in a dilemma whether to join major publishers or not.

One of the fundamental prerequisites of science is communication, which includes publishing the results of scientific research and interaction between researchers and publishers. Ever since the establishment of scientific publishing, journals have represented the most efficient and reliable way for scientists to distribute and archive their work. It has been the most effective way for scientists to disseminate their results, and a profitable way for publishers to add value to the products of research. And it has worked well over the past three centuries. Before a century and a half ago, libraries emerged as a kind of go-betweens, because constant growth of scientific data that was produced and presented back to scientists created the need for selection and organization of data presentation considering individual preferences of readers. And this has worked well for 150 years.

Then, in the early 1990s, we entered the electronic era, the time when technology allowed us instant access to an unlimited amount of information. It sounded like a scientist's dream – being a click away from unimaginable quantities of

full-text literature search, all without leaving the desk. The new technology brought us a kind of egalitarian utopia where information needs to be free. Unfortunately, as it was soon discovered, a click away from up-to-date research was also a click closer to the point where the link leads to the journal to which the library does not subscribe. World Wide Web (WWW) brought numerous positive changes, but strangely enough, also introduced higher prices of journals (1) and thus fewer subscriptions for libraries (2), creating the paradox of scientists being aware of all research done in their field, but having less of it actually available in full content.

Scientific publishers can be divided into two large groups – not-for-profit publishers and commercial or for-profit publishers. Not-for-profit publishers include learned societies and university presses. The market share of for-profit publishers has been growing, especially for several big publishers, who have experienced a dramatic increase in their journal collections since the 1970s, because, as stressed by Tenopir and King (3): (i) they were the ones starting most of the new journals; (ii) some learned societies turned over their journals to them; and (iii) they grew through several mergers (4). It is a pure economic "grow or disappear" logic that forces major publishers to buy new journals and thus expand their portfolio (5). They evaluate whether such journals ought to be drafted into the company's portfolio with what inducements. For them, it is an investment strategy aiming at capitalizing on a worthwhile journal, even if it means operating at a loss for a few years, because publishers know that the return of this investment will be ultimately significant and steady. The other way of minimizing the loss from smaller journals is the selling strategy called "bundling" (6). Publishers bundle access to weaker titles along with more popular ones, requiring libraries to pay for the whole package if they want favorable terms. For example, unit costs for serials at the American Research Libraries institutions rose by 188% between 1986 and 2004 (7) and the report from The Wellcome Trust, UK's largest research-funding body, stated that the present market structure in journal publishing does not work to the advantage of scientists and that publishers have raised their prices during the last decade well above inflation (8). The sharp rise in prices was, among other factors, the result of a huge increase in the number of journals (especially online journals) owned and operated by big publishers. This price increase was supposedly due to high costs of production and maintenance, although it is good to know that for-profit publishing is an industry with a total revenue of nearly ten billion $US and an average profit margin of 25% (6).

However, changes introduced by new communication technologies have deeply affected modern society, especially the means of communication. We have witnessed whole industries re-building their operational networks, redefining workflows which existed for centuries, and re-positioning financial and power centers. It was just a matter of time when scientists, who actually invented the technology and embraced its advantages sooner then the rest of population, would want to see benefits of Internet and WWW incorporated in scientific communication. For-profit publishers reacted quickly to the new technologies, offering its customers major improvements in publication process, such as online submission, manuscript tracking – speeding-up publication time, and many others benefits. On the other hand, they started a number of new online journals (which was technologically relatively easy and cost less than the print journals) and bundled those journals with most prominent titles. This forced libraries to spend their budgets on a small number of bundles, leaving them with no means for acquiring books or journals they initially wanted (2). There was another paradox that irritated scientists: their work was often government-funded, libraries were government-funded, but they had to spend government money to pay for the article her/his library was not

subscribed to. Somewhere in between, for-profit publishers were making vast profits, with no free peer-review cost and no charge from authors of the article. It was in 1998 that some eminent scientists, most notably Harold Varmus, Nobel laureate and director of the National Institutes for Health (NIH), decided to start a campaign on the "freedom of information." The result was E-Biomed, announced in May 1999, latter to become PubMedCentral – an archive of life-science journal literature operated by the National Center for Biotechnology Information (NCBI), already hosting PubMed and other databases. The main argument was that taxpayers pay for the research, so the results of it should be available to all (9,10). In 2000, BioMed Central, a for-profit open access publisher, was launched, followed by the Public Library of Science (PLoS), first an advocacy organization but soon an open access publisher aiming to compete with the highest quality journals (11). This call for immediate and free open access to scientific information was to become Open Access (OA) movement, formally based on 2002 Budapest Open Access Initiative (12), which provided the definition of OA and was followed by further statements, all named after the cities where meetings were organized. Open Access means immediate, free, and unrestricted online access to digital scholarly material, primarily peer-reviewed research articles in scholarly journals, published online. Two models became dominant in achieving this goal: publication of OA journals (which provide all their content freely and preferably without embargo) and archiving of articles in repositories that are freely available to the public, regardless of where those articles were originally published. There is no doubt that OA offers significant benefits to the society, but it also introduces a completely new economics in scientific publishing. Traditional reader-pays model is substituted by an author-pay policy, meaning that author is covering the costs of publishing. Of course, the authors do not generally pay publication fees from their own pockets, but rely upon institutional support or grant funding, and authors from economically less privileged countries are basically not charged at all. This new publishing model is the major threat for the big publishing companies, especially considering the fact that OA movement has been advocated by government organizations, advising or mandating authors whose research is government-funded to publish in OA journals (13).

We described current developments in scientific publishing industry, as well as emerging alternatives to traditional alignment of power. Now, we will try to discuss the *CMJ*'s position regarding offers by two large scientific commercial publishers.

While preparing this editorial, we debated about pros and cons of joining a major publisher. We searched guidance in an editorial which summarized the first ten years of the journal (14). Since a lot has changed in the past 5 years, it became evident that in order to give plausible directions for the future, our article will have to take a much closer look of not only the journal's present situation but also its course of development. Since the past of the *CMJ* is very well documented (15-18), we decided to take a somewhat different approach. Both publishers that approached the *CMJ* presented explicit benefits to the journal. There were five distinctive benefits and, by addressing each of them separately, we will try to present the arguments needed to make a decision about *CMJ*'s future.

Increasing international market presence

The success of any journal depends on developing a regular readership that will become a part of the journals' scholarly community environment, cite the journal's content in their own work, and inform their colleagues about the value of publication (19). However, to do so, they first need to be able to find the journal. "Findability" of a publication can be achieved and maintained by using different tools and activities:

a) Free open databases are collections of journal citation details, such as author names, article titles, journal title, volume and issue number, and abstracts maintained in a central, searchable database. The main tools used for collecting and presenting data include open indexes, directories, search engines, and open archive metadata harvesters. One of their principle advantages is that they are freely available on the Internet for anyone to use. In 1998, six years after launching, the *CMJ* was indexed in MEDLINE, the most important bibliographical database in biomedical science. Today, the *CMJ* is on the long list of online databases and search engines, such as Biosis, Scopus, EBSCO, DOAJ, Google Scholar, and Freemedicaljournals.com, insuring "findability," ie, its presence on the international market. Joining a commercial publisher would question *CMJ*'s presence in free databases and therefore limit its present market position.

b) Commercial indexing and abstracting products are similar to open databases, because they aggregate citation metadata into a single, searchable database or listing. In 1999, the *CMJ* was included in the most prestigious commercial bibliographical and citation databases, Current Contents/Clinical Medicine and Science Citation Index-Extended. This indexing, combined with the inclusion in MEDLINE, gave a major boost to the journal's impact factor, which is of relevance for *CMJ*'s market, authors, and readers.

c) The media releases are another important way of getting the word out about the journal (20). The media have rules of their own and it is highly recommendable that writing press releases, distributing them, and contact with media should be done by a person experienced in that field. The *CMJ*'s media editor is well experienced in both media relations and has medical background which makes him a perfect choice for the *CMJ*'s media presence.

d) Professional networks are another way of letting readers and authors (potential market) know about a journal and its value. The *CMJ* is a member of several professional organizations, such as European Association of Science Editors, World Association of Medical Editors, and Council of Science Editors. Another way of networking is presenting the journal at international meetings and congresses. The *CMJ*'s editors often participate in such events, promoting the journal and discussing publishing in general.

e) Professional recognition can be achieved in different ways. For example, the *CMJ* is the official journal of the Academy of Medical Sciences of Croatia and the Forum for Public Health in South Eastern Europe. The *CMJ* also regularly publishes research about the journal and activities around it. These research articles are published in international journals and in the *CMJ*.

So, what does it actually mean to increase the *CMJ*'s international market presence? In a "publish online or perish" situation, it seems that an improvement would mean better "findability" of a journal. The *CMJ*'s online user statistics shows that, since introducing LinkOut (MEDLINEs' method of linking to publishers Web site), there is an average of 5000 hits per month from MEDLINE to *CMJ*'s online full-text articles in PDF. Another 7000 visits come from Google Scholar. Higher percentage of visits from Google Scholar is recognized by other journals as well (21). Taking these numbers into consideration, it is plausible that the *CMJ* would in fact not benefit from joining a major publisher in terms of visibility, since the majority of our current readers find *CMJ* online from free search engines.

Working to improve the impact factor of the journal

The common goal and motivation of the majority of editorial boards of biomedical journals is quite similar: continuing improvement in the quality of papers published in their journals and positive competition with other journals to achieve the greatest possible visibility in the scientific community. The quality of a scientific

journal is largely measured by its impact factor, and improving it has become an obsession for editors.

For at least two reasons, the *CMJ* has always had a mission that was beyond a simple competition for a higher impact factor. First, it is not realistically possible for a regional journal such as the *CMJ* to truly compete with some other journals from the field of general medicine, which have a long history of far-reaching global influence. Furthermore, the primary mission of the *CMJ* has always been promoting good science in Croatia and other small and emerging scientific communities and presenting it to the world, as well as building local capacity to scientifically compete with the world at the highest possible level (17,22).

It has already been shown in other regional journals that such policy can eventually lead to an increase in journal's impact factor far beyond realistic expectations (23,24). Therefore, the benefit of a larger impact factor also does not speak in favor of joining a big commercial publisher. It could be argued that the *CMJ*'s current impact factor perhaps does not reflect the amount of effort invested into its publication and quality, but this is in great extent justified by its primary mission. Therefore, there is realistically not much that could be done to dramatically change the current impact factor of the *CMJ*, even through provision of special services by the publisher.

Copyediting and typesetting via publisher's offices

Copyediting and typesetting of the *CMJ* is now being done in-house, ensuring the high quality output, as well as control at every stage of manuscript editing. Outsourcing of copyediting and typesetting would clearly be a setback in journal's production workflow. Because of a high level of enthusiasm of the staff involved in the journal's production and support received from the Ministry of Science, Education, and Sports and the medical schools, there is no shortage in the team's staff and all those involved are highly qualified. However, the *CMJ* has been faced with another kind of problem, ie that the advancement of technology in the area of publishing and media in the recent years has been very fast and still accelerating. This requires continuing investments in ever-improving technical equipment and necessitates recruitment of highly skilled personnel, which has not been the case in the past. Thereby, the equipment is becoming increasingly expensive, whereas career prospects for highly skilled people needed to operate such equipment are usually far better in the industrial sector than in an office of a scholarly journal. For now, the *CMJ*'s staff is being able to handle all technological challenges, such as coding articles in XML for DOI, and more importantly for PubMedCentral (25). The journal's Web site still requires some improvements, but we can say that the *CMJ* is technologically competitive with most journals.

Marketing for revenue

The *CMJ* is definitely a not for profit journal. It has very stable financial construction. The *CMJ*'s owners are all four Croatian medical schools, each contributing either financially and/or logistically. Major financial support is provided by the Ministry of Science, Education, and Sports. This kind of support is financially more than satisfactory and also ensures the journal's independence. Being a part of a major publisher would eventually change journal's position. The *CMJ* is not only about publishing a journal; it is more about a whole group of activities based around it. The *CMJ* always aimed to become a center of quality and advancement in the Croatian scientific community. Activities such as workshops on scientific writing (26), the *CMJ*'s book collection, and research are all important for fulfilling this role.

Another area where the *CMJ* is not making profit is through donations and exchange of the

journal. In 2006, 1686 printed issues were intended for such deals, 480 in Croatia and 1206 abroad, increasing its visibility and helping local, often inadequately funded libraries. By exchange with 61 journals, 56 of these foreign, the *CMJ* has saved a significant amount of money for the Central Medical Library, affiliated with the Zagreb University School of Medicine. A commercial publisher would probably discourage such non-profit activities.

Another important question raised at this point was the question of ownership of the journal. When the *CMJ* was founded, the question of ownership was not a major one. Because of a long tradition of socialist economy in Croatia, many journals still do not have any legal framework, clear ownership structure, and legally established decision making process. The *CMJ*, however, successfully resolved all legal detail and established a model for small academic journals (27).

Marketing to attract articles

This offer is a tempting one for every small journal, which usually has problems with the number of manuscript submissions. The *CMJ* is not an exception and we would like to see more high quality papers submitted. The number of submissions has been constantly increasing over the years (28). In 2006, the *CMJ* received 416 articles (118 from Croatia), 297 of which were rejected by the Editor-in-Chief or editorial board, 72 rejected by reviewers, and 52 articles were published.

A scientific journal can attract more manuscripts by offering its authors a higher impact factor, which they need in order to advance in their careers or simply get more prestige. Our impact factor for 2005 was around 0.8. However, our readers and authors must not expect that CMJ's impact factor will continue to grow, because our primary goal is not to increase the impact factor or earn profit, but to serve as a bridge between science periphery and mainstream science and as a center for education and excellence (28). The impact factor is not a sole reason why authors publish in a specific journal. Some authors would want their articles to be freely and immediately available, which is the benefit not often related with journals with high impact factor.

Another important issue has to be taken into account. As we stated before, OA is becoming highly supported by government institutions and funds. Authors funded by the tax payers' money are being asked or mandated to publish in OA journals. At the same time, authors are motivated to publish in journals with preferably high impact factor, either for career reasons or simply prestige. There are many OA journals, currently 2688 in the Directory of Open Access (http://www.doaj.org), but not so many of them are indexed by the major citation databases – 190 in Thompson Scientific databases in February 2007 (29). This group of OA journals is a great choice for authors who have to publish in OA journals, but do not want to give up benefits of impact factor. The *CMJ* is an open access journal with a stable impact factor, which is another argument for not opting for realignment of power.

Conclusion

The *CMJ* editors have previously described the weaknesses of scientific medical journals from less advantageous environments (22), such as: limited pool of potential contributors, who are also scientifically relatively weak; inadequate pool of reviewers; poor review process; and the communication/visibility barrier of poor English constitute the circle of inadequacy for small journals. Those journals strive to achieve international visibility, mostly through becoming indexed in major bibliographic databases, such as MEDLINE, and Web of Science. The *CMJ* managed to break this vicious circle of inadequacy. From

the perspective of the last 15 years, 3 distinctive phases in the development of the *CMJ* can be identified.

Niche and profiling

The *CMJ* was founded in 1992 in the midst of war, mainly as an effort by the Editors-in-Chief to contribute in a way they knew best to the international affirmation of the young Croatian state. They were aware that their role was not to compete with large journals, but rather to increase originality by concentrating on topics and subjects of local character but international significance (30). A sentence from an editorial in the first issue of the *CMJ* (31) can best describe the *CMJ*'s purpose then and now: "Setting the standards is the fundamental aim of the *CMJ*." This phase was marked by tremendous effort by a small group of scientists, determined that job worth doing is worth doing well.

They did it so well that in 1998 the *CMJ* was indexed in the MEDLINE database, and a year after in Thompson Scientific database. Indexing in prestigious databases increased the number of submitted manuscripts, and the Editorial Board decided to increase the publishing frequency from 4 to 6 issues per year.

Establishment and recognition

The *CMJ* entered 2001 as a bimonthly journal with, for the first time, two full time employees. The journal was redesigned, and immediately received an award for design from the Association of Learned and Professional Society Publishers (ALPSP). A year later, two research fellows joined the *CMJ* to work on the research grant related to the journal. This allowed us to broaden the journal's activities, such as workshops on scientific writing and publishing the *CMJ*'s Book Collection.

Profesionalization

In 2006, two more editors joined the *CMJ*'s office. With professionalized production workflow, we were able to make an additional effort and succeed in publishing the journal's content in the PubMedCentral. We have an in-house statistical editor, editor specialized in clinical trials, public relation editor, and last but not least, editorial office manager.

Conclusion

After analyzing pros and cons for commercial publishing, we concluded that the *CMJ* would not benefit from such a change. Our interests are beyond making a profit and we still think that setting the standards and education are the fundamental aims of the *CMJ*.

Finally, the audience and readership of the *CMJ* are very loyal to the journal, which serves as a meeting point for many Croatian scientists who also work abroad, and it is unlikely that most of them would welcome losing its distinct national character and scope. Therefore, we may conclude that, for the time being, there are no pressing reasons for the journal to join any big commercial publisher. The journal should stay true to the course that has proven so successful in the past, and make sure to regularly and carefully re-evaluate its position in international medical publishing.

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