

PERSPECTIVE



BY Steven A. Wartman MD, PhD, MACP
AAHC President / CEO

For those of us growing up in academe, “publish or perish” was the well-established tradeoff for success. Promotion and tenure committees, composed of individuals

with variegated backgrounds and expertise, plowed through CVs, letters, articles, and other sundries (including citation indexes and impact factors) to reach a determination about the fate of the proposed candidate. Other factors, such as good citizenship and intrinsic value to the university, were informally considered. But, the emphasis always seemed to come back to the volume of papers and the journals in which they were published. I must say that, at the time, I never thought deeply about the inherent significance of academic publishing.

This issue of *Leadership Perspectives* casts an open and self-reflective eye on this topic by the forthright opinions offered by editors of three of the world’s leading medical journals. Their commentaries go well beyond the surface to address some fundamental questions to which all of us should pay keen attention. I urge you to read their comments carefully as you consider the future of the academic enterprise.

Howard Bauchner, editor-in-chief of the *Journal of the American Medicine Association*, notes that the trend towards open access publishing, fostered by the digital explosion, is changing the basic publishing business model, while also raising questions about the future of peer review. The sheer volume of information now available to clinicians and researchers is forcing a change in reading patterns towards short, concise summaries of articles published. The implications of this structural change, while not explicitly discussed, should, in my opinion, give us pause. Importantly, Dr. Bauchner comments that academic journal publishers are not effectively promoting their added value—a sentiment echoed elsewhere in this issue.

Jeffrey M. Drazen, editor-in-chief of the *New England Journal of Medicine*, offers an entertaining but germane perspective with the comment that his journal has gone from delivery by horseback to delivery by Facebook, Twitter, and other modalities. Alarming (at least to me), he suggests there is more money in author-based

than in library-based publishing, an observation with many confusing and concerning implications. Noting the trend towards open access, he makes the strong point that as it gets easier to publish, where you publish becomes more important. The price of subscription, he astutely reminds us, includes editorial discernment of topical significance.

Richard Horton, editor-in-chief of *The Lancet*, reflects on the enormous political demand for reliable technical information in the context of a growing global science convergence. He articulately describes the important social role of academic publishing. Journals, he feels, do serious work for society and do not exist simply to describe the world as it is. As such, they have the moral obligation to fight challenges to science while judging their worth by the impact that science has on society. He is also straight-forward in his opinion of the “impact factor” in promotion and tenure decisions, which, in his view, has led to some perverse incentives.

Several decades ago, as a young faculty member, I led a weekly journal club. An article was assigned and the presenter delved critically into every aspect of the article, including its relevance, methodology, results, conclusions, and next steps. Faculty members at the time were acutely aware of “publish or perish” and, although the number of publications was constantly increasing, it seemed possible to get a reasonable handle on a topic through careful research using the “Index Medicus.”

But the technological convergence of the 21st century is changing the fundamental nature of research, publication, and practice. Knowledge is becoming increasing external to the human mind, inhabiting some inchoate form of dense dynamic data clouds. This reality, in my opinion, poses an existential challenge to medicine as a profession, since the hallmark of a profession includes being the exclusive bearer of specialized knowledge to be used for the benefit of the client/patient. Increasingly, however, artificially intelligent machines are making probabilistic decisions about diagnoses and therapies. Information of all kinds and of varying quality is being flung out into the digital universe, all while we have less time and impetus to thoroughly read every word of a journal article. This issue is required reading, if only to stimulate a sanguine discussion regarding the foundations of our profession.

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Association of Academic Health Centers
1400 Sixteenth Street, NW, Suite 720
Washington, DC 20036
202.265.9600

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LEADERSHIP PERSPECTIVES

The Future for Professional Publication in a New Era



Howard Bauchner, MD

EDITOR-IN-CHIEF

Journal of the American Medical Association (JAMA)



Jeffrey M. Drazen, MD

EDITOR-IN-CHIEF

New England Journal of Medicine

DISTINGUISHED PARKER B. FRANCIS

PROFESSOR OF MEDICINE

Harvard Medical School



Richard Horton, FRCP, FRCPCH, FMedSci

EDITOR-IN-CHIEF

The Lancet

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Scientific journal publishing has evolved more in the last 15 years than it had in the previous 100 years. The rapid evolution in many areas raises critical questions about its future. There are also a number of issues that are still evolving, such as data sharing and conflict of interest.

One obvious, evolving trend is open access, which changes the relationship between an editor, publisher, and author. This moves publishing from one type of business model—in which the editorial team conducts peer review and, upon acceptance of a manuscript, the publisher owns the copyright and then creates revenue in different ways—to another, in which the editorial team conducts peer-review and, upon acceptance of a manuscript, the author pays a fee to the publisher while retaining copyright. In open access, the business model is almost entirely supported by author fees. It is a shifting editorial and publishing model and one of the primary changes in the field of medical publishing.

Another trend is the tremendous expansion in the electronic movement of content around the world through such channels as electronic tables of contents, social media (e.g., Facebook and Twitter), and the use of podcasts and video. The digital explosion has brought new approaches to moving content globally.

An emerging trend is that of funders serving or acting as publishers. In the United Kingdom, for example, the National Institute for Health Research (NIHR) and the Wellcome Trust have both begun to publish the results of research projects that they fund.

Another important issue is peer-review. When a journal, such as JAMA, sends out a paper for peer review, investigators spend substantial time reviewing that work. Today, though, some peer review is being conducted via crowdsourcing, where preprints of articles are posted for comments. (This is less common in clinical investigation in medicine than in other fields.) In terms of quality, is crowdsourced peer review equal to the

quality of peer review that can be orchestrated by a journal? Given that there have been no comparative studies, we simply do not yet know the answer to that question.

Journal publications play an important role in the evaluation of individuals for promotion and tenure. Many promotions committees recognize that assessing the quality of an investigator's work based on the "impact factor" of a journal is a limited way to assess the quality of that individual's contributions to the scientific endeavor. Promotions committees now look at the totality of an investigator's key contributions to science. Opinions of leading experts in a field carry increasing weight in assessing whether an individual should be promoted. Most promotion committees and researchers do recognize the importance of the impact factor of a journal, but in the United States, at least, I have found that promotions committees consider more than just where an individual has published his or her papers. In addition, the quality of a journal is simply not its impact factor. I applaud that change.

Journals have not been effective in promoting the value they add in the form of offerings, such as invited commentaries, editorials, or the educational material that they develop. Such pieces fall outside of traditional investigation, but as clinicians have become increasingly busy and potentially overwhelmed by the sheer volume of research, I think this content may become as important as research reports. In that regard, it is increasingly incumbent on journal publishers to deliver content in ways that are more easily consumed by readers. As one small example, JAMA has added a summary—called "Key Points"—of all the original research we publish. Providing a succinct overview, these are written in intentionally plain language so that they can be read quickly. Similarly, I think it is quite clear that many people would rather hear or listen to content than read it. Quicker, simpler approaches to disseminating information and packaging information in podcasts, video, or animations are good examples of trends that are likely to continue to evolve over the next five to ten years.

The models for scientific journals are evolving, but they aren't necessarily changing everywhere. We do see, however, that more money is spent publishing in the author-based model than in the library-based model.

Two important trends that I see in scientific journal publishing are that it's becoming more open and there's a lot more of it. New journals are starting up every time you turn around—particularly in subspecialty fields. The good news is there's more information. The bad news is there's so much information, readers sometimes don't know what to read or what to believe.

Some publication vehicles post on the web with little peer review. Others are much more rigorous. Given these trends, we may need to remind ourselves about the traditional peer review model. When an article has been published in a traditional journal, it means that academic peers have read and critiqued it. That becomes an externally given grade. If work is published in a highly selective journal, that speaks well of the work. If it's published in a journal that is more a posting vehicle than an evaluation vehicle, then I think that it will receive less credit academically. My personal opinion is that as it gets easier to publish, where you publish becomes more and more important. At the same time, I believe it is vitally important to consider the work itself.

To me, the ultimate standard is not where a paper has been published, but whether the work can be reproduced and if it furthers the field. It is of high value to see something published in 2015 and then we see its impact by 2017 or 2018. If the published research has changed the field that much, the authors truly merit promotion.

Information dissemination has always evolved. Our journal, for example, was founded in 1812. It cost \$3.00 for four issues a year, which arrived on horseback. Today, we have over a million followers on Facebook and a quarter of a million followers on Twitter. In 2012, we formed NEJM Group, and under this umbrella have expanded to develop platforms such as

NEJM Knowledge+, NEJM Catalyst, NEJM Resident 360, and NEJM Yi Xue Qian Yan as a way to further educate and disseminate knowledge. Also, we are committed to responsible clinical trial data sharing and have actively worked to bring together different constituencies to identify sustainable solutions. Throughout this evolution, the goal has been to share the best information available and to advance science and medicine.

Our readers are very busy; they don't have time to review the literature as closely as those with no clinical responsibilities. I see an evolving role for journals in selecting the most critical subject matter in terms of what readers want and need to know. Rather than having to read thousands of articles, a reader can trust the editors; the price of subscription includes editorial discernment of what is most important.

Now, about half of what's in our journal is research. The other half includes commentaries or cases that represent our in-house work product. Our journal is a mix of publicly-funded research, which is put up free after six months, and locally-generated content, for which we still charge. When we publish research that has an immediate public health impact, for example the Zika virus, we think it should be free immediately, and we've stayed true to that mark.

Medical science is a knowledge-based field. What you know makes a big difference. The New England Journal of Medicine stands firm in its commitment to provide healthcare providers with the best information available. We publish material because we believe it to be valid and of value, not because we are paid to publish it. I think that is so important in a day when you can read articles that may look true, but actually are not factual, or are more akin to advertising. We think it is critical that healthcare providers have access to a source of information that is truly reliable and do our best to be that source.

There is a growing sense of the shared human predicament that we face in the world. Addressing those predicaments demands escalating global action. Accordingly, I see an enormous political demand for reliable technical information coming from the life science and medical science communities. Evidence generated from biomedicine is needed to help shape and improve global decision-making. To that end, I think journals and their editors should take part in a global conversation about how we address critical problems and challenges.

There is a real desire to use the science and evidence that we generate as a platform for advocacy and political change, not just to let it sit in our journals or our libraries, but actually to make it do some serious work for society. Journals should not be there just to describe the world as it is.

Our culture is facing challenges in the current debate about science and evidence, facts, and truths. Such challenges foster doubt, suspicion, and mistrust in science. If such skepticism results, for example, in reduced funding for the NIH, it could challenge science's role as the basis for sensible and reliable decisions in our society. Journals shouldn't just be reporting about such issues; rather, we need to be much more aggressive than we have been in fighting the challenges to science.

In terms of changes in scientific publishing and the road to promotion, I think that many of our academic reward systems today do not serve their original purpose. I believe the "impact factor" has been extremely damaging to the evolution of science. It has created a set of perverse incentives that has meant that publishing large numbers of articles is more important than publishing good research. We need to rethink how we recognize talent and success. The faster we move away from the impact factor, the better for science and medicine. But we've been saying that for years, and killing the impact factor is proving very hard to accomplish.

I wish that we could focus much more on the content of what scientists publish. We need also to recognize that one of the biggest changes in research has been that good research is done by collaboration—often involving people working in different institutions, often

in different countries—where multidisciplinary teams all make important contributions to a final result. That's not easily reducible to an impact factor, or a simple equation of a contribution.

Science shouldn't be just about publication or impact factor or tenure or obtaining the next grant. It should be about having an impact on society. At the moment, we don't measure that impact very well at all. I think we need to focus much more on rigorous scientific methods to address what some have called the "reproducibility crisis" in science, and to think much more about why we're doing science. The goal of publishing research is only partly about access. It should also be about the quality of the work and the purpose that the work is directed to. Maximum access to low-quality work isn't very helpful to anybody.

Journals that accept a very high proportion of submissions have really turned upside down the tradition of publishing only a small proportion of high-quality papers. My concern is that if you leave peer review to post-publication, then the danger is that you could lower the overall quality of the scientific literature. But at the moment, we can't be certain. Time will tell whether that's been the right decision.

I look at the future of scientific publishing optimistically, but I think that in the next decade we are going to see a big shakeup in journals. I would prefer that publishing was seen less as a business and more of an institution of medicine and public health. Some of the big problems that we face are not being addressed, such as deepening inequalities in our ability to generate and apply knowledge and the enormous digital divide in availability of high quality information. I believe too many scientific publishers don't take the idea of the value they add seriously enough. Journals that will survive, and I think deserve to survive, will be those that actually add value.

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