E-biomed: scientific publishing's brave new world

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The proposal by Dr. Harold Varmus,[1] Director of the US National Institutes of Health, to create an entirely electronic repository of all biomedical publications — E-biomed — is the most recent and compelling sign that traditional scholarly medical journals (and we count ourselves among this group) are entering the electronic world. We are rather like a shuttle heading toward a space station. Like the shuttle, we need to work in synergy with this technologic marvel to dock safely. The danger is that we will collide; in such a collision E-biomed will survive, but individual journals such as *CMAJ* may not.

What is E-biomed? The essence of the proposal is that the National Institutes of Health through the National Library of Medicine (which operates MEDLINE and PubMed among other services) would set up a system to "transmit and maintain, in both permanent on-line and downloaded archives, reports in the many fields that constitute biomedical research."[1] Articles would be posted to E-biomed through 2 possible mechanisms. Using the first, authors would submit articles electronically to E-biomed's central server, requesting review by the "editorial board" of a journal (or approved scientific society) of his or her choice. The author could, for example, choose *CMAJ*. We presume that the manuscript would enter the designated journal's usual peer review and editorial process. However, once the paper was accepted for publication, it would be posted on E-biomed immediately, i.e., before appearing in the print journal. There would be some notation in E-biomed as to which journal had accepted and processed the paper.

The second mechanism involves posting on E-biomed in a "general repository" after minimal screening but without peer review. This mechanism could be utilized by authors who were not successful in placing their papers through the first mechanism or who do not wish to seek "endorsement" by one of the editorial boards. This "grey" nonreviewed literature would, according to the proposal, stimulate discussion among the scientific community and would be a "democratizing force that makes distance and wealth nearly irrelevant." It would open more publication opportunities for "trainees, little-known scientists, or scientists at less prestigious institutions."[1] We might add that it would also provide access to publication for exoteric disciplines and dubious science of all kinds.

For users, E-biomed would provide instantaneous, cost-free, full-text access to biomedical research papers. Authors would enjoy the advantage of retaining copyright on the condition that "intact versions [of their work] would be freely available for transmission, downloading, and publication."[1] In addition to providing easy access to the entire biomedical literature from any location at any time, E-biomed would offer enormous and as yet unexplored advantages in searching and linking to relevant reports — even, perhaps, to the original research data. And, not least, E-biomed would largely solve the problem of how to ensure that electronic versions of journals are made part of the permanent record. Already there are examples of publishers of electronic-only journals simply turning off their servers when their journals fail to generate profits, thus losing all permanent record of the research they had published. Almost all general medical journals already provide full-text access to their contents (regrettably, not yet *CMAJ*) with magnificent linking facilities to related articles and to any citations indexed in PubMed. However, only a few — the *British Medical Journal* is the most prominent in this group — provide completely open no-cost access. E-biomed would eliminate these barriers.

We support E-biomed's stated objectives to "accelerate the dissemination of information ... deepen discussions among scientists, and reduce frustrations with traditional mechanisms for publication." But will it "save substantial sums of public and private money"?[1] Scientific publishers, both commercial and association-based, have been criticized for making monopoly profits and extorting copyright from authors. Certainly, reviews of return on equity of major publishers support some of these claims.[2] But while this may be true of some medical publishers, there are many aspects of medical publishing as it exists today that well serve the best interests of the scientific community and the public and are worth preserving. We need to think twice before plunging into a wholesale electronic publishing scheme that may ultimately have the effect of seriously weakening and perhaps destroying existing print journals.

One of the virtues of good medical journals is the excellence of their editorial and peer review process. At *CMAJ* and the other journals that constitute the Vancouver Group, a typical paper is read by at least 2 editors and often by several others and by 2 or 3 peer reviewers in addition to, as warranted, a biostatistician. The manuscript is then carefully copyedited; there are checks of tables and figures, grammar, structure and internal consistency. Only then is it published.

Although the first mechanism for E-biomed publication preserves this process, the proposal in its entirety underestimates the complexity of peer review and revision and completely ignores the potential for E-biomed to severely reduce the subscription bases of print journals. Editing is not free. At *CMAJ* about 50% of our costs accrue in the

processing of manuscripts (managing the flow of almost 1000 papers a year and peer reviewing and editing them). The bulk of the remaining costs are for paper and postage. We rely on subscriptions — and the advertisements they draw — to cover costs. Without this revenue we would not be able to edit the journal. With instantaneous posting of scientific articles to E-biomed, many subscribers, including libraries, would cancel their subscriptions, preferring to access research information directly through E-biomed.

General medical journals play a role in helping their readers, mainly clinicians, interpret the results of clinical studies by providing editorial commentary, review articles and medical practice updates. E-biomed will not provide this complementary material. If general medical journals disappear, the publication of these commentaries, reviews and updates would fall to throw-away journals and continuing medical education programs that are almost exclusively supported by pharmaceutical companies. The interpretation of medical research, at least for physicians, would merge with marketing.

We believe these issues can be resolved through wider discussion with editors and publishers of the benefits and pitfalls of electronic publishing. For example, it may be advantageous for journals to make their electronic rather than print edition the version of record. This would allow immediate posting of a paper after it is accepted and would reduce the delay (now about 4 months at *CMAJ*) between acceptance and publication. The issues of copyright are more complex and need further discussion. Varmus has invited commentary on his proposal: interested readers can see some of these on the NIH Web site[3] and elsewhere.

Dr. Hoey is Editor-in Chief of CMAJ

References

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