Pre-Submission and Post-Publication Reviews as Partial Solutions to the Fundamental Inadequacy of Public Health Science Peer Review

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ABSTRACT

Though attempts have been made to improve the peer review process, these have not resulted in any widespread change. In its most common form, peer review is no assurance of identifying even basic methodological errors or biases. There is a tendency to overly restrict participation in the critical discussion, with invited participants often unable to devote sufficient time to adequately assess a study. Typically, there is no mechanism for communicating much of the worthwhile information exchanged during the review process. Worse, once the article is pronounced "peer reviewed" and published, there is little record of the process and no means of further development. In its present form, peer review is as much an impediment to scholarly discourse as it is a means of quality control. Our website, epiereview.com, builds on previous and existing alternative approaches by starting with a working paper approach, opening the pre-publication review discussion to a wider range of interested parties. The working papers, online journal club and archive of rejected letters to the editor offer researchers options for improving their manuscripts before they are etched in stone and forums for post-publication review.

Keywords: Peer review, authorship, critical discussion, transparency, journal club, working papers

The current system of peer review, often treated as well-tested, beneficent, inviolable, and inevitable, is none of these. Journal article peer review emerged in the early 18th century, and was in practice by 1893 in the British Medical Journal (BMJ), but was neither ubiquitous nor expected in the health sciences until the late 20th century [1]. However, apart from taking advantage of electronic article and review transmission, there has been little attempt to improve it. Some variations have been considered by a few journals (e.g., changing anonymity requirements; publishing the reviews with the article), but the level of innovation is remarkably limited given the level of frustration with the current system experienced by sophisticated readers and authors in the health sciences, the most voluminous science of the day.

INTRODUCTION TO EPIEREVIEW.COM

The limitations of peer review as practiced are particularly evident in epidemiology and related public health sciences, which are characterized by acceptance of weak methodology, influence of worldly politics, unreported methods, datasets that are not available for review or secondary analysis, and an unmanageable volume of papers to review. Publications in public health sciences probably generate more popular interest and have more practical influence than any other science that is not directly related to product development. Yet there is little recognition of the low average quality of the publications, and even less prospect for improving it.

In response to the limitations and challenges of the current peer review process, we created a website (epiereview.com) that is a collection of tools, including a working paper series and an online journal club. The tools described here have been piloted and released to a selected international group of participants at the time of this writing. By the time of publication, participation will be opened to anyone with appropriate expertise or credentials (defined very broadly, to include students and experts outside of research institutions). The general public will be able to read but not post to this website. Most of the details are still in play, and feedback is very welcome. Participating is even more welcome, being the sine qua non of the project. Epiereview is intended to address the limitations of contemporary peer review, as described below.

INADEQUATE FEEDBACK AND EXPOSURE OF NEW WORK

The epiereview working paper series allows authors who are interested in improving their papers, or are concerned about censorship by the peer review process, to post their work online (providing a form of publication) and collect comments. Interested readers, including but not limited to recruited reviewers, can post comments on a message board. The author can then respond to comments and revise the manuscript based on more than the comments of two or three reviewers (the typical level of critical review) before the content is etched in stone in a journal. Circulating pre-publication versions of a paper is normal practice in most fields, but is almost unheard of in health science, and thus many opportunities for improving papers are lost. Just as important, ideas are either not circulated as soon as they might be, or are rushed into publication without serious review. Authors who prefer a more careful pace, or whose ideas are ahead of their time and difficult to publish, need better ways

to get broader exposure and credit for their ideas.

If there is demand, we will develop a journal that gives contributors the option of publishing their papers as peer-reviewed publications, based on the reviews that are posted, rather than having to take them to an existing journal. When Bingham et al studied a more open approach to peer review in the Medical Journal of Australia (MJA), they found that though few readers commented, the actual comment quality was high (90% of the comments were deemed potentially useful) [2]. Selected MJA papers were made openly and fully available online. The response rate was low enough to easily be accommodated, but the authors of the study surmised that the model might have had difficulty scaling up (we hope to address the latter by making the system self-governing).

LACK OF ACCOUNTABILITY: USELESS REVIEWS, BIAS, AND CENSORSHIP

Authors and journal editors can be confident that their publications will escape serious scrutiny, and even fundamental flaws will be overlooked once a paper has the imprimatur, "peer reviewed publication." Most of the target audience consists of non-scientists (policy makers, clinicians, activists, and journalists) who probably only read the abstract and the conclusions that the authors claim. Few of them realize that getting a "peer reviewed publication" is merely a matter of trying enough journals – ignoring reviewers' comments from the rejections – or taking advantage of "crony peer review" (wherein some editors or journals can be counted on to publish almost anything that comes to the "correct" conclusion). The only forums available for the many expert readers who might eventually identify flaws are letters to the editor, few of which are published, and so their insights are lost.

Several of epiereview's tools are intended to respond to these challenges. Bad analysis alone

is part of the problem. While a war of attrition against bad analysis is a hopeless exercise, the epiereview online journal club encourages critical post-publication reviews. In addition, the online journal club takes advantage of the many interested readers, particularly students, who carefully review published papers but then have nothing to do with their analyses. Participants choose papers to "discuss" via online message boards. If participants believe that a comment, correction, or other response is worth writing, a wiki allows them to jointly author it. The result can be published elsewhere but will also be made available to the scientific community in a searchable form, rather than evaporating at the end of the journal club meeting.

Public health is a highly politicized field, but lacks the ethics that have developed in other such fields to minimize the triumph of politics over open scientific inquiry. There are two effective cures for such politics: sunshine (a.k.a. making work available for publicly examination and comment) and the embarrassment of being proven scientifically incorrect. The ethos in public health science comes dangerously close to scientific relativism, that nothing is ever incorrect. Epiereview offers some push-back against this, while offering ample sunshine.

Another tool at epiereview that will further the open dialogue is the rejected letters to the editor archive. It is distressingly difficult to get a letter published, even when it cites an extremely important flaw in a published article (or perhaps because of that). Casual interactions with colleagues suggest that fundamental critical observations about articles far outnumber the submitted letters (and even more so, the published letters). Why bother to write a letter when it is unlikely be published, and will hardly be noticed if it is? Epiereview will publish any letter to the editor that is a substantive response to an article that is rejected by the journal. We will include keywords such that the letter will show up on serious searches

for information about the article and provide a discussion forum that allows the original authors to respond, but not to just get the last word, denying all the criticisms, as is the current practice – the discussion will be open.

Inappropriate reviews are often more frustrating than flawed articles. Anyone posting a working paper to epiereview is encouraged to post any reviews they receive from journals to the files accompanying the working paper, to add both good and bad comments to the record. The latter may not prevent inane or political reviews, but at least it provides some accountability and establishes a public record. If the research is faulty, the comments and reviews reflect this, but if the result is merely disliked, negative responses clearly demonstrate that the science is not faulty. This is a distinction that is lost in the contemporary peer review system.

Epiereview will make additional contributions to peer review and publication accountability with a blog that will examine failures and successes, including giving interested authors, reviewers, and editors an opportunity to recount their experiences with the system.

ANONYMITY AND LACK OF PUBLIC ACCESS TO REVIEWS

While there are arguments in favor of anonymous and secret reviews, the philosophy of epiereview calls for moving as far from this as possible. Reviewer anonymity is intended to facilitate candor, but there is a slippery slope from candor to the internet flame-war mentality, and anonymity denies the reviewer credit (or perhaps more often, accountability). Genuine author anonymity is almost impossible in most cases. When it is successful, it helps ensure that the reviewers judge the analysis and not the author's reputation (or worse, the reviewer's personal feelings about or fears of the author). However, sometimes judging the author (and what else they have written) is

crucial. The justification for not publishing reviews is not clear; it seems to be motivated primarily by logistical ease.

Epiereview does not allow for anonymous postings. Working papers need to be openly authored for obvious reasons. (And less obvious reasons – e.g., it is difficult for someone's advisor or collaborator to steal their ideas once they have been published in some form.) But we argue that trying to keep authorship anonymous from reviewers does far more harm than good. While deferring to big-name authors because of who they are is unfortunate, there are legitimate reasons why authorship is informative. Indeed, keeping authors anonymous would effectively preclude authors from circulating papers for comments before submitting them. Signed reviewer comments will introduce accountability and should eliminate the common destructive reviewer comments that often effectively say, "I do not like the conclusions of this paper, so it must be wrong and should never be read by anyone." Reviewers too should be judged based on their background and preferences (a.k.a. conflicts of interest). At the same time, they should get credit for their contributions and authors should be allowed to bolster their credibility by reporting that they responded to particular individuals' comments. With all parties identified, further communication that can clarify comments and improve the paper is possible, and we hope this occurs. Signing working papers allow readers to view the manuscripts within a context of the author's previous work, and makes the discovery of any undisclosed obvious conflicts of interest more likely. Disclosure of reviewer identity on epiereview allows for a deeper dialogue among interested parties. A dialogue among authors and reviewers is preferable to one monologue followed by three others, connected only by an editor. Both authors and reviewers have a public record of their contributions and insights.

The resulting public record of comments and responses provides highly interested readers with more information about a paper, including access to possibly compelling suggestions or comments that the authors chose to ignore. The option of posting peer review comments received from journals further contributes to this, in addition to its contributions to accountability.

LOGISTICAL CHALLENGES

Part of the problem is logistical: Even though an article may eventually have hundreds or thousands of critical readers (and ten times that many uncritical readers), those assigned the task of scientifically reviewing it before it is published inevitably have limited knowledge and little time to devote to the many (often dozens) of reviews they are asked to do each year. One model of expert reviews is that they act as gatekeepers, controlling what information – often arcane and requiring specialization to interpret other than superficially – is available to the broader audience [3]. However, with great responsibility comes substantial power, and that power is often abused (to censor disfavored ideas) or, more often, underused. Even if the best possible reviewers are identified and agree to contribute (a vanishingly rare condition), they still can probably spend enough time and effort to offer only half the good suggestions that the first wave of post-publication readers think of. Even seasoned reviewers have been shown to miss substantial errors due to lack of time, narrow focus, inadequacies of the reviewers, etc. [4]. When more reviewers take part in the process, the likelihood of more errors being caught increases.

By contrast, we hope that epiereview generates comments from the many independently motivated readers who are interested in carefully reading a working paper, and that tens of readers volunteering suggestions will provide more complete critical advice than two or three

readers doing a commissioned review. We are attempting to take advantage of the model that permeates much of modern communication, that every informed reader can be a contributor and that the crowd can better identify many types of errors and areas for improvement than can a few top experts (some version of this is what is usually meant by the "Web 2.0" model). But we also believe that critical discussion among recognized experts (i.e., peer review, in the natural sense of that term) will not be effectively replaced by the crowd in the near future.

We are experimenting with a hybrid. We can observe that: YouTube videos attract dozens or hundreds of comments, but this enthusiasm produces precious little that is worth reading; the Wikipedia authors do a great job compiling conventional wisdom and facts and the collective proves amazingly good at catching errors, but that system is poor at dealing with advancing knowledge and cannot effectively deal with scientific uncertainty or disagreement. Reviewers who understand science, the methods, and the subject matter can offer much more than anyone else -- if they have sufficient time, editorial and communications skills, and the ethical discipline to offer useful assessments rather than try to censor competing ideas. We are searching for a model that attracts participatory enthusiasm and freedom, providing the wisdom of the collective, but reaps and keeps the insights from the most skilled readers that modern science demands.

We hope that epiereview offers a logistically practical approach because it takes advantage of what scientific readers are already doing. The standard peer review system asks people to do something that they were not planning to: Very carefully read a particular paper with an eye to identifying all aspects that could be improved. The difficulty of this task, along with how much time it takes and how tedious it is when the paper is not something the reviewer would have chosen to read carefully once it was published, explains much about why the peer review process takes many months, is often superficial, and is quite often hostile or fundamentally wrong.

Similarly, the journal club is an attempt to see if hundreds of students and others who already regularly participate in journal clubs, and others who would like to, might find international collaboration to be worth the small cost of typing their comments. As for writing up the analysis resulting from the journal club, and writing more letters to the editor, these go beyond what is already done anyway, so our model is dependent on the hypothesis that there is pent up demand for an outlet for such efforts.

CONCLUSION

This collection of tools, while a modest start considering the volume of the relevant literature, directly addresses many of the problems with current peer review processes. The forum and permanent archive of critical analyses of influential public health science papers improves the net quality of what is published, improving upon existing tools such as letters to the editor. Moreover, it creates the prospect that misleading or sloppy research will be identified as such, increasing the incentive for journals and authors to improve quality. The working paper series allows authors in these fields to do what is expected of researchers in other fields: address the feedback of many interested experts before final publication (while getting immediate reputational credit for their work). Working papers also offer a way to disseminate information quickly, and with little cost, without having to wait for final publication, and without having to commit to the version as permanent.

The current publication and review process in the health sciences is, like most established institutions, controlled and fiercely defended by those who benefit from it. They have little

incentive to change in the face of criticism. Thus, we have created a system that can overlay the existing system without requiring cooperation of the establishment. We have no illusion that those who benefit from the current flawed system will embrace this supplement, but the many who dislike the problems with the current system or suffer from it, including innovative young researchers who wish to offer core innovations, can make epiereview work in spite of this. If it does work, it will create external pressure on the insular established system.

Peer review has been criticized since its inception, yet reform has been haphazard and for the most part nonexistent. Good attempts have been abandoned. Sometimes good ideas, like vegetables to a 5-year-old, need to be presented many times before they gain a foothold; we are seeking the sweet spot that is the sweet-peas of the vegetable foodhold. Of course, with a project like this, comments and participation of everyone reading this are welcome.

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DISCLOSURE

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