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What are preprints?

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In 2012, I wrote an editorial for *Medwave* on duplicate or redundant publications [1]. In that editorial, I explained why in that issue we were including a paper that had previously been published in full-text in the proceedings of a medical congress. The submitted manuscript underwent peer review and we accepted it even though we knew we were going against the International Committee of Medical Journal Editors (ICMJE) recommendations of that time (2004) (http://www.icmje.org/recommendations/archives/2004_urm.pdf). ICMJE recommendations specifically state that journals should only publish novel work, or one only presented to a meeting as an abstract or short version. In that editorial I also explained that even while we follow ICMJE recommendations, we also believe that we must adapt them to our reality, and that we have to engage in the broader discussion on who owns knowledge and how it is disseminated.

More recently, the ICMJE issued a new version of its recommendations (2016) and…oh surprise! Now it *does*include the possibility of publishing something already published previously in full extension. This is how they state it: "This recommendation does not prevent a journal from considering a complete report that follows publication of a preliminary report, such as a letter to the editor, a preprint, or an abstract or poster displayed at a scientific meeting." (In http://www.icmje.org/icmje-recommendations.pdf).

What is interesting about this statement is that for the first time they mention the term "preprint." So, what is a preprint? Why has it become a buzzword? What is *Medwave's* position on preprints?

Preprints are generally defined as the publication of the complete report on – usually - the results of a scientific investigation, in a dedicated server to this type of communication (preprint server). Preprints are not peer-reviewed and it is understood that they will subsequently be submitted to an academic journal to be peer-reviewed and published formally as an academic paper. As it is understood in the world of scholarly publishing, the difference between preprints and proceedings, blogs or others of this sort, is that they receive a DOI, a digital object identifier, and that they have a full citation (although I must say that increasingly so do conference proceedings). Until not long ago, medical journals refused to publish anything that appeared anywhere in full extension prior to submission, and the only possible editorial decision was rejection. One of the reasons invoked was that duplicate publications could bias meta-analyses by double counting papers reporting results of clinical trials in systematic reviews (and creating duplicate counts for patients as well).

This is how things were standing until some time ago. As Bob Dylan beautifully expressed in 1964, "the times they are a-changin". Now there are many basic science journals and biomedical journals that are issuing editorials stating that they are in effect willing to receive submissions of papers that have been prepublished as preprints [2],[3],[4],[5],[6],[7],[8],[9],[10], and I found only one that explicitly says that they will not [11].

Let us be clear: it is not that in just a few years the whole scenario of biomedical publications changed. We are still doing more or less what we used to do a couple of decades ago. What changed was that biomedical journals were forced to adapt to a reality that had already imposed itself in physics in the early nineties. Back then, researchers in physics, mathematics and other exact sciences (as well as econometrics), started to post their papers in a server called arXiv. By doing this, they were able to communicate their advances and were able to exchange much more quickly with other researchers in their same fields. They saw the need to accelerate the pace of dissemination of findings, and this also occurred with biologists. Looking even further back, in the sixties there was an initiative in the National Institutes of Health of the United States to share photocopies of manuscripts among a large group of investigators. However, biomedical journals soon opposed this and squashed the initiative as it went against their

interests [12]. The need to accelerate and democratize the process of scientific exchange, therefore, is not new. It comes from far back. During the eighties, it was normal for authors to send their manuscripts by post to other colleagues who would comment and help advance the field. This sharing also prevented unnecessary duplication of research. Indeed, in 1967, a *Science* article was already saying that journals should "recognize the need for very rapid communication in certain fields, and meet the threat of public preprint-exchange systems in these fields by themselves publishing preprints in an appropriately limited manner." [13]

Not being able to submit a manuscript that has been in some way available in the public domain is a norm that was essentially established by the top biomedical journals [14]. Back then, and now, these journals seek to publish mainly novel and "positive" findings (favorable to the experimental intervention). At the same time, they issue press releases to further increase the impact of the published paper, which in turn helps prop up the impact factor. All of this becomes curtailed if the full findings are previously posted somewhere else. The impact factor is well known to people in the academic career. In order to advance and obtain recognition from their academic institutions, investigators must preferably publish in high-impact factor journals. And thus comes about the vicious circle of academic career, university ranking, editorial prestige and, lastly, power and influence in the world of science.

Physicists, however, solved this equation a long time ago. Their journals never had any problems in accepting submissions of manuscripts previously posted as preprints in arXiv. They were able to harmonize two goods: to foment the rapid advance of science while preventing unnecessary duplications of research, and to help investigators move forward in their careers as their papers get published in peer-reviewed, indexed journals. Now, we are seeing that in other disciplines such as biology, chemistry, geology, epidemiology, among others, pressure is increasing to publish the results of research faster [15],[16],[17]. The problem that motivates this evolution is that it is taking too long for journals to process manuscripts from date of submission to date of publication [18]. In the meantime, grant proposals follow their course and it is not infrequent that young researchers get shortchanged as their papers are still not published when grants are decided. This is why a few years ago, a new server specifically devoted to biology was opened up, called bioRxiv. Similar to arXiv, scientists can now deposit their findings in bioRxiv weeks or months before their formal publication [19].

Recognizing this problem, several funders of scientific research expressed concern about the need for more rapid publication systems than were being offered by traditional scientific journals. A timelier access to the real output of a researcher who is submitting a grant proposal was deemed necessary. Consequently, the agencies gathered in February of 2016 in a meeting called ASAPbio (Accelerating Science and Publication in biology) [20] and issued a consensus statement strongly recommending that full research results should be published as a preprint *and* submitted at the same time to a peer-reviewed journal [21].

This is new, and this is good. This democratizes access to the results of biomedical research, as well as the research output from many other fields. It also takes off the pressure for journals to comply with the ICMJE recommendations that, as I point out in our case, often lag behind what is actually happening at great speed in the world. As we stated in 2012, the ICMJE recommendations must be coupled with a balanced perspective on not only local realities, but also world-wide realities coming about in the different scientific disciplines.

Back then we published a paper that had already been previously published as a "preprint" in the conference book of a meeting. We published it because it was a good manuscript that became even better after peer review. Because we did it then and explained why, we now again state that we do not fear preprints, that we do not consider them to be self-plagiarism or redundant publication, and that we are open to receiving submissions of preprints. Authors must inform the editors that their work is available as a preprint, it should be cited as such and a DOI provided, because this ensures full traceability of the work and guarantees a transparent record. And no, we are not afraid that systematic reviewers may become confused and risk duplicating patients in meta-analyses, as they are well enough prepared to deal with this.

So, preprints are a reality that is here to stay and *Medwave*, as always, is open and willing to lead the region on any beneficial and positive developments that may arise in the field of biomedical publications.

Notes

Competing interests

The author declares that as editor-in-chief of the journal, she is interested in receiving submissions of preprints that cover topics in line with the journal's purpose. She also declares that she is a member of COPE, Committee on Publication Ethics, and that she has participated in several international meetings where preprints have been discussed among journal editors, publishers and funders, in the last three years. She declares that she has received reimbursement from COPE for travel expenses.

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