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## EDITORIAL

# Institutional research and biomedical journals: Poor quality articles and honest researchers!



Richard Horton, the Editor-in-Chief of *The Lancet*, published an editorial (April 11, 2015) that requires a response [1]. The passivity of the scientific community has been astonishing. Based on findings of a confidential English symposium, the editorial asserts that much of the biomedical literature is simply untrue. Does this worry us? No, in fact, no one seems to be paying any attention! We remain convinced that research scientists are honest.

## The current state of science: a decline rather than excellence!

These accusations are grave indeed, whether they originate from prestigious journals like *The Lancet*, from individual scientists, or from the public media:

- “the case against science is straightforward: much of the scientific literature, perhaps half, may simply be untrue. Afflicted by studies with small sample sizes, tiny effects, invalid exploratory analyses, and flagrant conflicts of interest, together with an obsession for pursuing fashionable trends of dubious importance, science has taken a turn towards darkness” [1];
- individual scientists who have sounded alerts to the scientific community have not been heeded. Take the example of two recent articles that were more constructive than accusatory; they proposed specific strategies to reform scientific publication [2,3]. The system of inducements and rewards for scientific publication puts researchers in an inherently stressful situation, discourages collaboration, and encourages bad practices. There is a need to change this ultra-competitive scientific culture where success is measured according to the aphorism “Publish or Perish”. Important structural reforms will be necessary;
- the scientific community’s failure to respond to this issue has led the public media to publish articles that have devastated public credibility with regard to science. A *New York Times* article voiced concern about the increase in retractions of articles published in prestigious journals. *Le Monde* did not hesitate to publish an article entitled “Faussaires dans les labos”, (*Laboratory Forgery*) with the subtitle: (*Data fabrication, falsification, plagiarism, as well as surreptitious embellishment of results: scientific misconduct is on the increase and impedes the advancement of scientific knowledge. How are these practices being combatted by scientific institutions?*) [4,5].

How does the general public perceive this issue? The response of those qualified to defend science and show the excellence of scientific practice has been weak indeed. And yet, most researchers are honest.

Surgical research has not been immune from these criticisms. Twenty years ago, Richard Horton likened surgical research to a comic opera [6]. Since that time, the situation has improved slightly [7]: the publication of randomized studies has increased by 50% in the last ten years with a significant improvement in methodologic quality (in the statistical sense of the term,  $P < 0.001$ ), and the rate of published studies with minimal bias has increased from 6 to 14%. This still leaves 86% of surgical studies that are potentially biased [7], with bias including even *post hoc* modification of the principal outcome criteria. Forty-three percent of randomized surgical studies registered in the [www.clinicaltrials.gov](http://www.clinicaltrials.gov) database had to be discontinued due either to slowness of patient accrual, undesirable effects, or administrative problems. The majority of these interrupted studies were never published [8]. In addition to the wasted expense of public or private money, of time and human energy, nearly half of the scientific data (which might have been potentially useful for patient care in surgery) have been lost.

## Critiquable research practices (accepted!) are far more common than outright fraud (condemned!)

Bad scientific practices have historically been categorized by the US Office of Research Integrity under the rubric of FFP (Falsification, Fabrication, Plagiarism). Very few data are available to evaluate the prevalence of these practices. Actual falsification or fabrication of data is probably very rare. A proxy indicator for the incidence of fraud might be the number of article retractions: i.e., fewer than 500 per year out of 1.5 million articles indexed by Medline. Many of these retractions have been occasioned by honest error.

Plagiarism, whether voluntary or involuntary, consists of the theft (misappropriation, diversion) of another person's idea, hypothesis, theory or actual data for the profit of the plagiarist. Voluntary or even involuntary omission of a reference citation indicating the source of re-transcribed

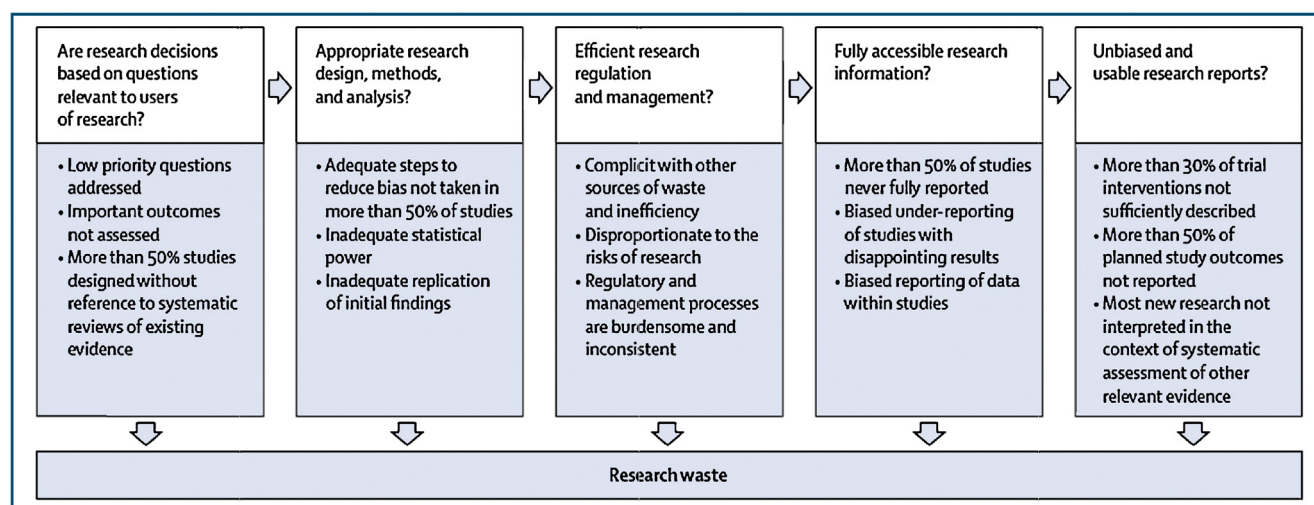
information in a manuscript leads to the erroneous suggestion that the author has originated this information. Copied information can consist of text, scientific tables or even photographs. Plagiarism occurs quite frequently. While it is probably less serious than the other practices, it is never excusable. It is an easy attitude to attribute such faults to student error; but the academic community is complicit in this error. Detection of this type of plagiarism may be only the tip of the iceberg [9]. How big is the underlying iceberg? According to the editorial in *The Lancet* [1] and to the estimates of researchers who prefer to remain anonymous, up to 50% of articles in the scientific literature contain cut-and-pasted or paraphrased plagiarisms or outright false information.

Data embellishment, the "beautification" of articles, the little arrangements to smooth a curve or "improve" a statistical analysis, falls into the category of QRP (Questionable Research Practices) or Critiquable Practices, and this seems to be a frequent occurrence [10]. The jargon to describe such practices varies in different fields; the so-called "Chrysalis effect" described in business management is not unlike what we see in biomedical sciences [11]. So-called "HARKing" (Hypothesis After Results are Known) is a sport played by many researchers without realizing that it is an unacceptable practice, since many researchers have not had proper methodologic training. An excellent synthesis of these practices was published in five articles in *The Lancet* in 2014 [12–16]. We have appended a figure summarizing the findings of these five articles (Fig. 1). There is a large literature concerning QRP practices. Those who participate in the upcoming congress on this subject will be astonished (<http://www.researchwaste.net/research-waste-equator-conference/>).

## Blamable even if not responsible?

*"Journals are not the only miscreants. Universities are in a perpetual struggle for money and talent, endpoints that foster reductive metrics, such as high-impact publication. National assessment procedures, such as the Research Excellence Framework, incentivise bad practices"* [1].

This says it all, and the problem exists throughout the world, not just in the United Kingdom!



**Figure 1.** Synthesis of five articles aimed at improving quality and reducing waste in research, with a list of practices to be avoided [12–16].

Is everyone at fault? It's simple: university professors sincerely believe that the fault lies entirely with the editors of scientific journals, who do their work badly. The journal editors, in turn, think that if the universities did their work properly, the journals would only receive submissions of good-quality articles, pre-evaluated by the university institutions. This is clearly a dialogue of the deaf to which we can offer no solution. The truth probably lies somewhere between these two extremes. It is easy to say that journals do a very poor job of peer review; this is all too true, but the manuscript review is performed at the university level. It is equally easy to say that the universities submit poor-quality manuscripts; this, too, is true, but the journals publish them anyway. It is not the journals' mission to take on the role of the universities in evaluating and auditing the quality of practices of submitted manuscripts. [17].

Will anyone step up to take responsibility? Denial of the problem of pollution of the scientific literature is a frequent attitude. The dominant interest is to reward innovative researchers who publish so-called "positive" results. How would a researcher's reputation suffer if his CV consisted of 80% negative articles published in low-prestige journals? Who will recognize that a few arrangements have been made with the strict truth? A meta-analysis of 21 large studies showed that only 7% of scientists admitted having QRP problems, yet they recognized QRP problems in 14% of the articles of their colleagues [18].

It is more comfortable to do nothing. It would be better to follow the pathway traced by the physicists, but that would suppose the publication of truthful research.

*"Can bad scientific practices be fixed? Part of the problem is that no one is incentivised to be right... Those who have the power to act seem to think somebody else should act first"* [1].

We all need to react now rather than wait until waiting for the great day of the Last Judgment. Let us cite several recent initiatives (admittedly an incomplete list) particularly in France: "sans attendre le grand soir" waiting for the great day???

The *Journal of Visceral Surgery (JVS)* has been attentive to this problem, and, in 2008, called attention to their concerns [19]. An editorial in 2014 recommended transparency, adherence to good research and publication practices [20]. While the JVS does not have the power to alter the practices of researchers, it has instituted good practices as a requirement for publication. The institution of quality criteria by French journals should help our scientific community [21]. It is a good first step, but the road is long. Biomedical journals have also reacted to implement of the work of the Committee on Publication Ethics ([www.publicationethics.org](http://www.publicationethics.org)).

- The French Minister of Higher Education and Research demanded a report on scientific integrity in 2010. The 69-page report proposed eight specific recommendations [22]. While institutions are aware of the problem, attitudes persist within the institutional structures to protect poorly performing researchers. We congratulate the evaluation agencies that have added scientific integrity to their recommendations and the institutions that have published guidelines for responsible research [23,24].
- The physicists have shown the way but no one listens to them. *The Lancet* cites the example of the particle physicists: "Following several high-profile errors, the particle physics community now invest great efforts into intensive checking of data prior to publication. By filtering results through independent working groups, physicists are encouraged to criticise. Good criticism is rewarded"

[1]. A basic problem is the enshrined statistical standard of  $P < 0.05$ , which should urgently be replaced by a higher level of proof:  $P < 0.001$ ...

- The San Francisco Declaration On Research Assessment has set in motion a series of reflections that are becoming known in France [25]. This declaration was signed by 581 learned societies and institutions and by 13,000 researchers (July 10, 2015). This is a good start. The next world congress on scientific integrity will take place in Holland in 2017. In France, regular meetings with regard to scientific integrity have been organized under the aegis of MURS-IS (Mouvement Universel de la Responsabilité Scientifique-Intégrité Scientifique), and a university colloquium has been organized to take place in Bordeaux on January 29, 2016.

Researchers are generally honest, and, as Ioannidis has suggested [26], it should be second nature to publish truthful research. He has proposed certain reforms: research should be collaborative and large in scale; a culture of systematic replication of results should be adopted; studies should be registered with protocols, analysis codes, data sources, and results; sharing of data is indispensable; oversight of conflicts of interest between sponsors and authors is essential; appropriate research methods should be adopted; definitions and analyses should be standardized; stricter thresholds should be adopted to define the significance of findings and success rates; the standards for conception of studies should be improved; there is need to improve peer-review, publication, and dissemination of the research; researchers need better formation in methodology and statistics.

NB: The authors have deliberately inserted in this editorial a plagiarized paragraph (with the approval of the original authors) simply to show how difficult it is to detect plagiarism without systematic analysis of scientific manuscripts. In hopes of improving this situation, we encourage our editors to systematically make use of anti-plagiarism software.

## Disclosure of interest

H.M.: Organizer of MURS-IS (Universal Movement for Scientific Responsibility-Scientific Integrity), member of the working group for good practices in scientific journals of the French HAS (High Authority of Health).

K.S.: Editor of the *Journal of Visceral Surgery*, Editions Elsevier-Masson.

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