Editorial

In the Kingdom of the Blind, the One-Eyed Man is King: The Case for The International Journal of Statistics in Medical Research

Why bothering with statistics if you are interested in medicine, and why bothering with medicine if you are interested in statistics? These questions keep coming to mind to students, physicians, patients, decision-makers, and all those involved in one way or another in statistics and medicine. Indeed, despite the efforts of many pioneers who have struggled in the past and those who continue today to fight to advance both statistics and medicine together, collaboration between statisticians and physicians has not always been the rule. While this might sound as bad news, it means we have much room for improvement.

In the past, statisticians were limited in their efforts by lack of computing power, while physicians had no expertise nor willingness to devote to time-consuming and complex statistical analyses. This changed when modern computers became available, enabling statisticians to perform even very challenging analyses requiring significant computational capabilities, such as those based on resampling [1]. However, such analyses required at that time code making in user-unfriendly software packages, limiting the application of these practical advancements to statisticians only. The subsequent diffusion of user-friendly packages for statistical analysis (e.g. SPSS [IBM, Armonk, NY, USA]) has much popularized even complex statistical methods, leading to a widespread uptake and application of statistical expertise in medical research.

However, this phenomenon has not soothed everybody, as some die-hard statisticians remain concerned that physicians with limited theoretical knowledge in statistics may misuse such powerful analytical tools, confusing significant p values and narrow confidence intervals with truth and wisdom. Accordingly, a return to more complex and less user-friendly statistical software packages has been recommended. While we politely disagree, and consider user-friendly analytical packages a great means to increase participation in the creation and diffusion of medical statistical knowledge, we agree that the status quo is not satisfactory.

Today, with novel media and technologies enabling immediate communication between thousands of people worldwide, the role of scholarly journal is being continuously challenged and questioned. However, to date scholarly journals based on peer-review remain, paraphrasing Winston Churchill's famous quote on democracy, the worst method to select and disseminate scientific results excluding all those other previously tested. Thus, scholarly journals remain a suitable venue to foster scientific endeavors and disseminate knowledge. In this sense, the birth of the International Journal of Statistics in Medical Research represents a bold and hopeful step. Other journals with a similar scope and established pedigree are already there (Table **1**), but the exponential growth in manuscript submissions and article downloads means that medical statistics still represents an area of unmet needs (Figure **1**).

Table 1: High Impact Scholarly Journals Focusing on Statistics in Medical Research

Journal (abbreviated title)	Impact factor as reported in 2012	Pertinent publications
Biometrical J	1.3	59
Biometrics	1.8	171
Biometrika	1.9	78
Biostatistics	2.2	54
Brit J Math Stat Psy	1.3	28
J Biopharm Stat	1.3	78
Multivar Behav Res	1.4	34
Pharm Stat	2.1	67
Stat Appl Genet Mol	1.5	50
Stat Biopharm Res	0.5	46
Stat Med	1.9	258
Stat Methods Med Res	2.4	36

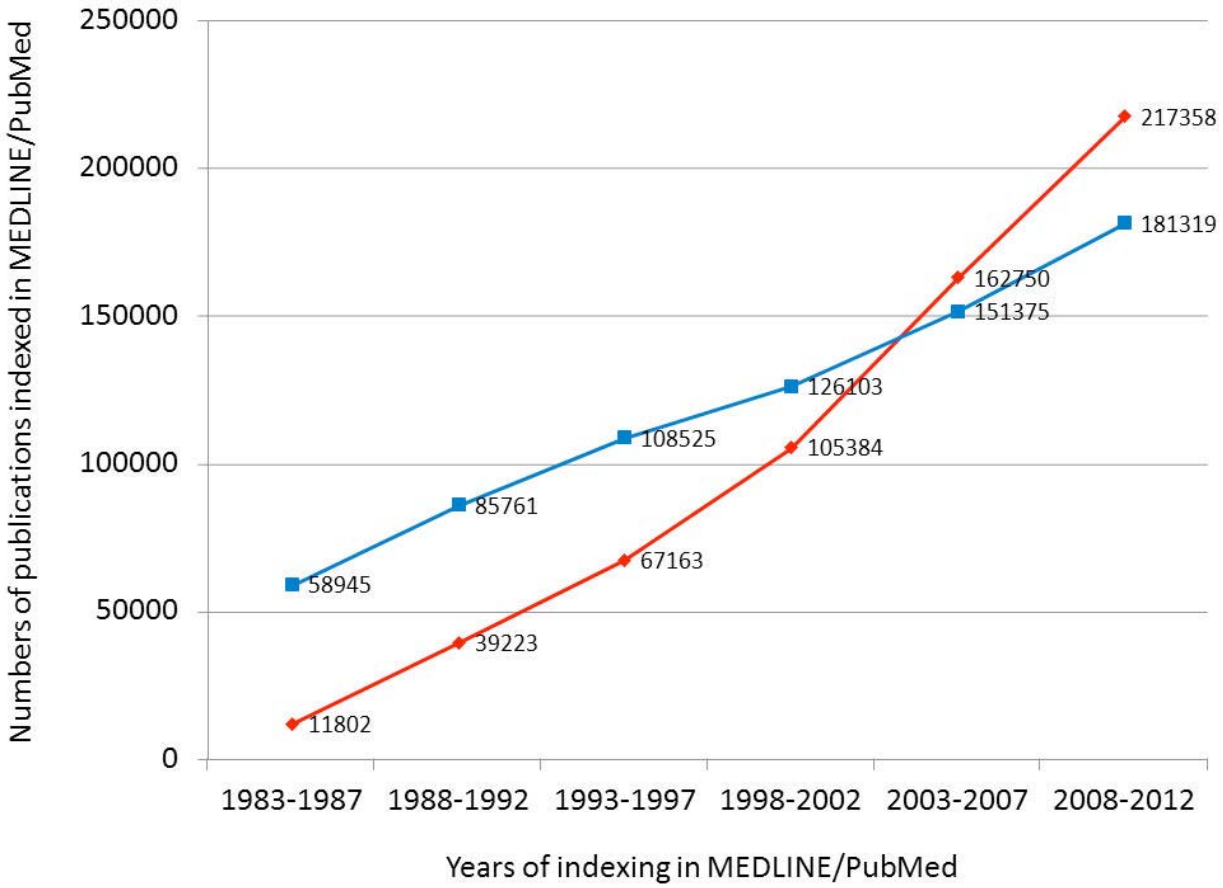

Figure 1: Exponential growth and impact of medical statistics in the international scholarly literature in comparison to other apparently more important or impactful topics (such as those relating to virology). MEDLINE/PubMed queried on January 6, 2013, with the following two search strategies: "((medical OR medicine OR clinical) AND statistic*) OR biostatistics OR biometric*)" (red line) and "virus OR viral" (blue line).

It is our privilege to accept the leadership of this new Journal, which will be managed by an international team and will abide to a specific set of rules and goals in order to ensure quality, credibility, and, ultimately, scholarly success (Table **2**). In our humble opinion it is especially important to aim for a multidisciplinary stance. If it is true that the great advancements in science depend on new methods rather than new theories, then it is also true that such methods need application, testing, and validation in different situations and by different researchers. For instance, while Kaplan and Meier might be honored to know that their method for survival analysis is still the most commonly used one even in top medical journals [2-5], several alternative approaches have been reported over the last decades, yet few have been applied in any consistent fashion. Whereas this might just be due to the fact that the Kaplan-Meier method is so good that does not require improvements, it might also be easily explained by a certain fatigue and laziness among clinical researchers who do not want to bother with such analytical issues or challenge themselves with novel approaches. This is profoundly wrong and undermines the very same credibility of statistical methods in general and their applications in medical research in particular.

In keeping with Karl Popper's doctrine, in science we can only trust what we continuously and constructively challenge and criticize, rather than take for granted [6]. Accordingly, new and alternative statistical methods and approaches must be proposed and preliminarily tested in a formal fashion by statisticians, yet medical researchers must be encouraged to subsequently apply these new methods and disseminate their findings. The International Journal of Statistics in Medical Research will come in handy here, as the Journal can be a suitable venue for studies comparing different analytical methods or applying new or less commonly reported ones. Indeed, even old statistical theories and approaches can be worthwhile, as clearly demonstrated by the successful application of Bayesian statistics more than 200 years after its original development [7].

Table 2: Editorial Agenda for the International Journal of Statistics in Medical Research

Goal	Details
Code availability	We strongly recommend to provide detailed codes for statistical analysis, in order to enable external replication
Data availability	We strongly recommend to provide the very datasets used in the article for statistical analysis, in order to enable external replication
External peer-review	We strive to apply external peer-review to most submitted manuscripts, irrespective of priority or apparent quality features
Full disclosure	We strongly recommend complete disclosure of conflicts of interests and funding
International breath	We encourage submission of suitable manuscripts from anyway in the world, aiming to ensure representativeness and readership to all those interested
Multidisciplinary stance	We welcome manuscripts dealing at large with biomedical statistics, including both theoretical and applied works, as well as papers reporting clinical works with important methodological implications
Protocol registration	We strongly recommend to register online trials and reviews in suitable online registries before manuscript submission, in order to minimize duplicate efforts
Thorough reporting	We strongly recommend to adhere to current reporting guidelines (e.g. EQUATOR) to ensure readability

In keeping with these goals, we might try to provide the hypothetical profile of authors, reviewers, and readers of the International Journal of Statistics in Medical Research. We hope authors to be motivated, assertive, yet capable of subjecting themselves to the constructive critique of reviewers while proposing their novel statistical methods or reporting the results of the practical applications of simple as well as complex statistical approaches. We wish reviewers to be careful, gentle, yet precise in pinpointing weaknesses and strengths of submitted manuscript, always remembering that the best motto for a peer-reviewer is Thou shalt love your neighbor as yourself [8], and that only readers and scholars quoting the published article are its final jury. Finally, we are certain that readers worldwide, with different background and goals, may be able to enjoy and exploit the articles published in the International Journal of Statistics in Medical Research, enabling it to gain reputation and credibility, while concomitantly serving the broader goals of science.

FUNDING

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CONFLICTS OF INTEREST

None.

REFERENCES

[1] Biondi-Zoccai G, Romagnoli E, Agostoni P, Capodanno D, Castagno D, D'Ascenzo F, *et al*. Are propensity scores really superior to standard multivariable analysis? Contemp Clin Trials 2011; 32: 731-40. http://dx.doi.org/10.1016/j.cct.2011.05.006

[2] Kaplan EL, Meier P. Nonparametric estimation from incomplete observations. J Am Stat Assoc 1958; 53: 457-481. http://dx.doi.org/10.1080/01621459.1958.10501452

[3] van Hagen P, Hulshof MC, van Lanschot JJ, Steyerberg EW, van Berge Henegouwen MI, Wijnhoven BP, *et al.* CROSS Group. Preoperative chemoradiotherapy for esophageal or junctional cancer. N Engl J Med 2012; 366: 2074-84. http://dx.doi.org/10.1056/NEJMoa1112088

[4] Scirica BM, Bonaca MP, Braunwald E, De Ferrari GM, Isaza D, Lewis BS, *et al.* TRA 2°P-TIMI 50 Steering Committee Investigators. Vorapaxar for secondary prevention of thrombotic events for patients with previous myocardial infarction: a prespecified subgroup analysis of the TRA 2°P-TIMI 50 trial. Lancet 2012; 380: 1317-24. http://dx.doi.org/10.1016/S0140-6736(12)61269-0

[5] Mehari A, Gladwin MT, Tian X, Machado RF, Kato GJ. Mortality in adults with sickle cell disease and pulmonary hypertension. JAMA 2012; 307: 1254-56. http://dx.doi.org/10.1001/jama.2012.358

[6] Popper K. The logic of scientific discovery. London: Routledge, 2002.

[7] Palmerini T, Biondi-Zoccai G, Della Riva D, Stettler C, Sangiorgi D, D'Ascenzo F, *et al*. Stent thrombosis with drug-eluting and bare-metal stents: evidence from a comprehensive network meta-analysis. Lancet 2012; 379: 1393-402. http://dx.doi.org/10.1016/S0140-6736(12)60324-9

[8] Holy Bible, Mark 12: 31.

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