

Chapter 16

SCIENTOMETRICS IN MEDICINE: A NARRATIVE REVIEW

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INTRODUCTION

In medical publishing, the quality of contributions to literature by researchers, papers and/or journals are compared and measured with so-called “quality” indicators. These indicators apply various methods to calculate the said quality or “impact”, which usually involves citation count. Industrialization of science, along with medicine, and the age of the Internet, undoubtedly led to the increased number of publications, increased number of journals and a need to effectively analyze, understand, qualify and quantify this ever-increasing data. These data are significant in a way that will direct several purposes, such as selecting journals for paper submission, measuring academic competence of researchers, diverting financial support or purchasing subscriptions for libraries.

Scientometrics, a subfield of bibliometrics and informetrics, involves itself with measuring and analyzing impact (i.e. citation profiles) of scientists, scientific papers and/or scientific journals. Modern scientometrics stems from Derek de Solla Price and Eugene Garfield, which the latter was the father of Science Citation Index (SCI) and Institute for Scientific Information (ISI) (1). These different calculations can be conducted on author, article or journal levels and represent an overall associated prestige. Although the aim of scientometrics is to measure impact, there are more than several criticisms for different scientometric indexes; it is difficult to pinpoint which of the scientometric indexes would be the so-called ideal index. For a researcher, understanding these indexes and knowing how to read them with their pros and cons will help them find the most appropriate index or indexes for their field of science.

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sue with IF is that citation skew overestimates a journal's IF, as demonstrated in a study on Plastic Surgery journals, where two thirds of the published articles failed to reach their respective journals' IF (22).

Based on similar data, The San Francisco Declaration on Research Assessment (DORA) lists potential pitfalls of IF:

- Citation distributions are highly skewed.
- The properties of the journal impact factor are field-specific.
- Journal impact factors can be manipulated or gamed.
- Data used to calculate the journal impact factors are neither transparent nor openly available to the public.

DORA also recommends against using journal-based metrics as a measure of the quality of papers, researchers or institutions such as funding agencies. DORA recommends the use of multiple metrics to provide a richer understanding of journal performance, citing primary literature rather than review papers to give credit where it's due and assessing scientific content rather than scientometric scores for committees about funding, hiring or promotion decisions (23).

CONCLUSION

When evaluating scientometric indexes, researchers should note how the measure is calculated, what it represents and if the measure is field-specific or not. Nevertheless, field specific studies comparing scientometrics are needed to understand publication and citation profiles of each scientific field. Therefore, it would be more reasonable to evaluate a journal, a paper, or a scientist, considering the advantages and disadvantages of scientometric data, as well as the extent to which they correlate with each other in the field of science. All researchers should be aware of the pitfalls of scientometric measures and all DORA statements for further understanding of the current situation regarding scientometrics. Using multiple metrics at once, especially not using IF alone, using quartile based and field specific measurements would be the most sensible current approach to scientometric data.

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