
Original articles

Assessing the bibliometric performance of a 'Special Issue': a citation analysis using the Web of Science® database

Derek R. Smith

Faculty of Health, University of Newcastle, Ourimbah, Australia; derek.smith@newcastle.edu.au

Peter A. Leggat

Anton Breinl Centre, James Cook University, Townsville, Australia

Shunichi Araki

Saitama Occupational Health Promotion Center, Saitama, Japan

Abstract Questions have often been raised by journal readers, authors and editors regarding the intrinsic value of 'Special Issues'. We examine the bibliometric performance and relative impact of a special issue published in the Japanese journal, *Industrial Health*, in 2007. Citations tracked by the Web of Science® database between 2007 and 2011 were analysed by type, frequency and impact. Overall, our results suggest that the special issue had a considerable influence on the bibliometric profile of the journal in which it appeared. The study revealed that special issues can attract more immediate citations and more overall citations than regular issues as well as having a positive effect on its impact factor in the years immediately following publication. Further bibliometric analyses are now warranted to evaluate the long-term performance of special issues and to investigate their overall impact on the scientific community.

Keywords Bibliometrics; citation analysis; the immediacy index; the journal impact factor; periodicals as topic; journal editors.

Background

In recent years it has become increasingly apparent that not all scientific discoveries have substantial implications, and not all journal articles are equally attractive to the scientific community. Widely-used journal citation analyses can provide evidence which allows scholars to assess the relative impact of each item as well as the bibliometric performance of an entire publication. Citations are now viewed as the 'currency' of modern science,¹ and their analysis has become increasingly important for journal editors, authors and readers.² Citation counting has been used as a bibliometric tool in various forms since the late 19th century. However, it was not until the mid 1950s that a more systematic approach to the tracking and assessment of citations was proposed by the founder of the Institute for Scientific Information (ISI), Eugene Garfield. His concept of an 'impact factor' was proposed to rank scientific periodicals and to help distinguish the core journals that were influencing science.³ The widely used Journal Impact Factor (JIF) scores are now published annually by Thomson Reuters in their Journal Citation Reports® (JCR). Calculation of the JIF is based on the number of citations received in a given year by a journal from other Web of Science® (WoS) indexed journals, divided

by the number of substantive items published by the same journal in the two preceding years. A watershed occurs when a JIF value exceeds one, indicating that, on average, more articles are being cited than are being published.⁴

In October 2007, the Japanese journal *Industrial Health* published a special issue entitled 'Emerging occupational hazards among health care workers in the new millennium'. This issue, edited by us, contained one editorial, five reviews, six original papers, one short communication and one field report.⁵ Although the journal has published 25 special issues since 1996, the citation-based performance of these publications has never been fully explored, and many editorial questions have often been raised regarding the role and value of special issues.⁶ As such, the aim of the current study was to examine the bibliometric performance of a special issue published in *Industrial Health* journal by examining citations tracked in the WoS database.

Methods

For the most part, the methods we used in the current study were based on previous research and publications in the field of bibliometrics.⁷⁻¹² We analysed citations to all 14 articles in the special issue as tracked by the WoS database between 2007 and 2011. Citations to articles in the special issue were examined by year and category, with additional analysis being undertaken to estimate the overall effect of a special issue on various performance indicators such as the JIF. The first step is to establish the numerator to be used – in this case, the number of citations received by each article of the special issue on an annual basis. The second step is to establish the denominator, and this can be estimated using Garfield's original formula.⁷ The third step is to determine the timeframe for counting citations. Garfield originally chose a two-year citation 'window' as his investigations had found that the majority of article citations are received in the first few years after publication.⁸ An examination of Garfield's original explanation of the criteria,⁷ as well as a more recent publication on how citable items are classified by Thomson Reuters,⁹ suggests that all 14 articles in the special issue would be deemed 'citable'.

An additional strategy for assessing the bibliometric performance of a special issue is to estimate its contribution to official JIF scores and JCR citation rates. This can be achieved by comparing the official scores from 2007 onwards with trends that were occurring at the journal

prior to the special issue appearing. Regression towards the mean almost always occurs in real life,¹³ and as such, this represents a novel but reasonable method for considering bibliometric data, both with and without the special issue. Owing to the aforementioned two-year citation counting 'window' of the JIF, an article published in a given year will influence the JIF scores of two subsequent years. Citations to articles in the 2007 special issue would therefore have influenced both the 2008 and 2009 JIF scores, so additional analysis was undertaken for these two years. As the journal did not receive an official JIF score between 1995 and 1997, trend analysis in the current study was performed for the longest possible time period, 1998 to 2006.

Results and discussion

Citations by year and category of article are presented in Fig. 1. Overall, review articles attracted the largest proportion of total citations (52%), followed by original articles (32%), the editorial (7%), the field report (5%) and the short communication (4%). The citation ratio of review articles was 1.8 in the first year following publication (2008), it then peaked at 4.2 in 2009 and has remained above 4.0 since (Fig. 2). This higher than average 'citability' of review articles compared to other article categories is consistent with previous research conducted elsewhere.¹⁰ Importantly, 57% of articles in the special issue were cited at least once within the first year after publication, and all articles had been cited at least once within two years of publication. This is a much better result than that reported in some other bibliometric studies conducted on the same journal. In one earlier study of *Industrial Health*, for example, it was shown that one-third of all articles published in the journal between 1987 and 2006 did not attract any citations at all.¹¹ On the other hand, the overall citation ratio for the special issue has been around 3.0 since 2009. The official JIF scores for *Industrial Health* were 0.792 in 2007 and 0.745 in

2008. If we assume that the JIF reflects an average citation frequency,¹² then the special issue was at least three times more effective at attracting citations than a regular issue was over the same period.

Aside from citations occurring over time, it is also worth considering how rapidly the special issue's citations were received and this can be measured by estimating their 'immediacy'. Official JCR immediacy index scores are calculated by dividing the number of articles published in a given year by the number of times they are cited in the same year. The official immediacy index score for *Industrial Health* was 0.231 in 2007, meaning that, on average, each article was cited 0.231 times. An estimate of the special issue's 'immediacy index' can be calculated by dividing the number of citations it received in 2007 by the number of articles it published in the same year. This calculation gives a score of 0.428, which is almost double that of the journal's official JCR immediacy index of the same year.

An examination of linear citation and JIF trends from 2007 onwards, both with and without the special issue, provides some additional, interesting findings. It is worth considering what the official JIF 2008 and 2009 scores might have been without the special issue. These figures can be estimated by removing the special issue's 2008 and 2009 citations from the numerator and its citable items from the denominator of the official calculation. Little difference was evident in the first year post-publication, suggesting that the JIF might have been less than 5% lower in 2008 without the special issue. However, the difference was more pronounced for the 2009 JIF, as every article from the special issue was cited at least once in that year. In fact, one-quarter of all citations received by the journal in 2009 were to articles published in the 2007 special issue. As a result, the 2009 JIF was approximately 30% greater than it might have been had the special issue not been published.

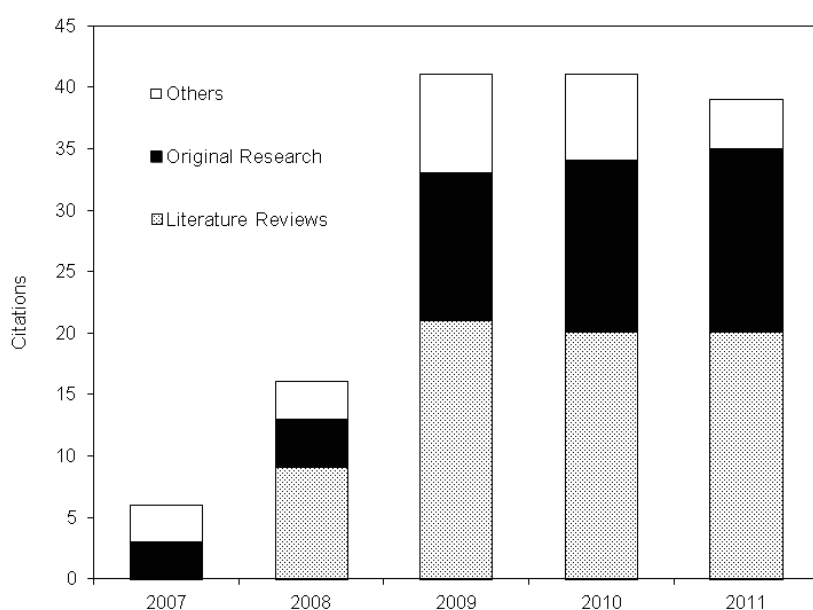


Figure 1. Citations by article category and year, 2007-2011 (based on Web of Science® data)

Conclusion

Overall, our analysis suggests that the 2007 special issue from *Industrial Health* had a considerable impact on the bibliometric profile of the journal in which it appeared. The current study revealed that special issues can attract more immediate citations and more overall citations than regular issues, a result which is in accordance with other research.¹⁴ Editors should, therefore, be mindful of the role that special issues can play in boosting the profile of a journal and attracting the interest of authors and readers.¹⁵ Aside from potential bibliometric advantages, special issues may also appeal to readers by providing convenient and highly educational material on a specific topic.¹⁶ Further bibliometric studies are now warranted to establish the long-term performance and the overall impact of special issues on the scientific community.

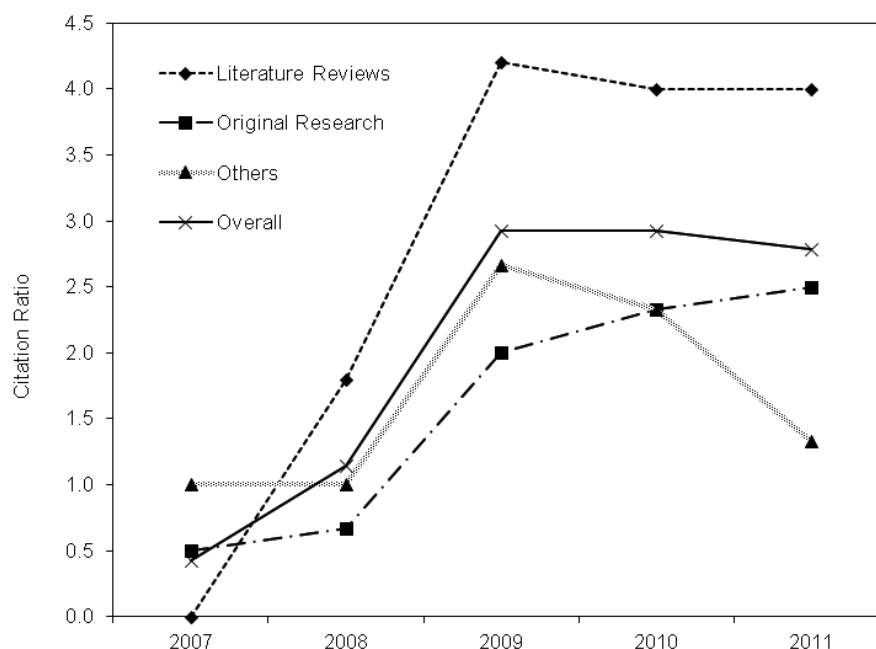


Figure 2. Citation ratios by article category and year, 2007-2011 (based on Web of Science® data)

Competing interests

DRS, PAL and SA are on the Editorial Board of *Industrial Health*.

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