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**Bibliometric analysis of the Scandinavian Journal of Work, Environment & Health—results from the past 10 years**  
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## Bibliometric analysis of the Scandinavian Journal of Work, Environment & Health—results from the past 10 years

### Why bibliometric analysis?

A crucial step in the scientific process is publication in a peer-review journal. Many scientific journals provide the necessary opportunities for prospective authors to publish the results of their studies. Since scientific progress relies on the use of each others' results, it is important that articles find their readership. Measuring the scientific impact of an article has turned into a science in itself. One of most frequently used measures is the number of citations over a given period. Scientific journals are compared with respect to their ability to produce citations, and the impact factor, although widely criticized, has been adopted as a measure of citation rate.

### What is the impact factor?

The impact factor is the average number of times articles from a journal published in the previous 2 years have been cited in a given year. In other words, the impact factor is simply the ratio of the number of citations over a period of 2 years after the year of publication to the number of citable items in a given year. The calculation of the impact factor shows that articles only contribute when picking up citations in the 2-year time window after their year of publication (and most citations probably in the second year, since, due to publication delay, it is unlikely that a paper picks up a citation within the

first 6–9 months of appearance). Increasingly, the authors' decision to submit a paper to a particular journal depends on the impact factor of that journal.

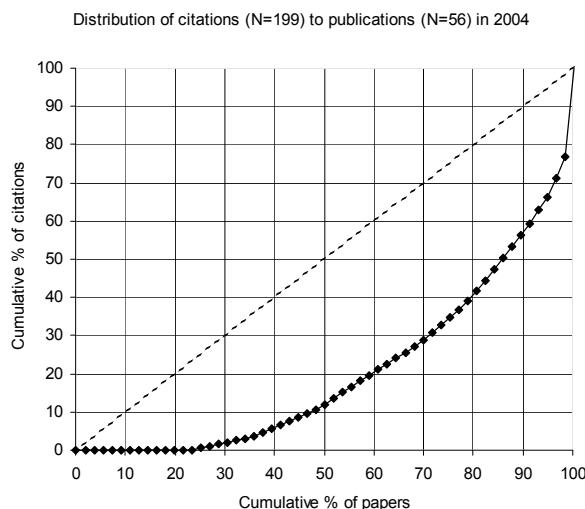
### Contribution of papers to citations

A rapid evaluation of the distribution of citations relative to the source publications is presented by the Lorenz curve in figure 1. The Lorenz curve is a graphic representation of the cumulative distribution, showing that the bottom x% of the publications contribute y% to the citations. Its origin stems from research on inequalities in income.

Figure 1 presents the Lorenz curve for the 56 publications in 2004 and the 199 citations in 2005 and 2006. The area between the broken line representing perfect equality ( $y=x$ ) and the Lorenz curve is an expression of the inequality of the citability of articles. The bottom 23% of the articles ( $N=14$ ) has 0% of the total number of citations, the bottom 50% has 12% of the citations, the bottom 80% has 40% of the citations, and the upper 10% has 44% of all of the citations. The distribution may vary from year to year, but it is expected that similar patterns are observed across years. The conclusion is that the *Scandinavian Journal of Work, Environment & Health* has a skewed distribution of citations among its source publications.

### Which papers have contributed to citations?

Table 1 shows that full articles comprised 75% of the source publications and contributed 63.3–68.9% of the articles to the total number of citations. Not very surprisingly, the relative contribution of editorials was much higher for source publications than for citations, implying that editorials were cited less than the average source item. In contrast, reviews attracted a two- to



**Figure 1.** Lorenz curve for inequality in the citability of articles published in the *Scandinavian Journal of Work, Environment & Health* in 2004 being cited 2005–2006.

**Table 1.** Relative distribution of articles and citations according to type of article.

Type of article	Publications 2003 (N=60) (%)	Citations 2004–2005 <sup>a</sup> (N=183) (%)	Publications 2004 (N=56) (%)	Citations 2005–2006 <sup>b</sup> (N=199) (%)
Article	75.0	68.9	75.0	63.3
Editorial	16.7	14.8	14.3	5.5
Review	8.3	16.4	10.7	31.2

<sup>a</sup> For articles published in 2003.

<sup>b</sup> For articles published in 2004.

threefold higher number of citations than the average source item.

A similar analysis was conducted for the topics of the source items (table 2). Areas of research that performed better than average with respect to citations are (in hierarchical order) psychosocial factors, musculoskeletal disorders, and occupational health. Areas of research that performed worse than the average are exposure assessment, respiratory disorders, and indoor air. There is some variation between years, but the overall topic-to-citation ratio seems reasonably stable for the topics with at least a few papers published in each year.

#### *What articles have been citation-rich in the past 10 years?*

The preceding evaluation is rather sensitive to a few good papers. In other words, the analysis does not present useful information on individual papers, and thus the topic area analysis should be more interpreted in the sense of which topic is "hot" and which topic is "not hot". Another approach is to look back over the past 10 years and evaluate the key articles that have contributed to the total number of citations after their publication.

An analysis was conducted with the Web of Science on all citations in 1997–2006 for papers published in the Journal in 1997–2006. This huge list of citations to papers was ordered by the number of citations per paper per year. Altogether, 27 publications attracted at least 5 citations per year with a maximum average of 18.6 citations per year over a 10-year period. This analysis illustrates the rapid growth in the area of musculoskeletal disorders, which features with 12 of the 27 frequently cited publications, varying from exposure assessment of risk factors and epidemiological studies on associations between risk factors and disorders to consequences in terms of sickness absence and disability. Thus emerging areas are important for citations to original articles. Altogether, 6 of the top 10 publications were reviews, a clear indication of the importance of reviews with respect to citations.

#### *General considerations*

The presented analysis will probably not raise many new insights; instead it merely confirms current thoughts about the topics and types of papers that are important for scientists to be cited. These citations determine the impact factor of the journal. Whether we like it or not, the impact factor plays an increasingly important role in the selection of journals by prospective authors who are pressured by their performance indicators to publish in journals with the highest impact factor. A few years

**Table 2.** Relative distribution of articles and citations according to topic.

Topic	Publications 2003 (%)	Citations 2004–2005 <sup>a</sup> (%)	Publications 2004 (%)	Citations 2005–2006 <sup>b</sup> (%)
Exposure assessment	6.7	2.2	10.7	4.0
Indoor air	6.7	5.5	1.8	1.5
Musculoskeletal disorders	18.3	25.7	19.6	20.6
Occupational economics	1.7	1.6	3.6	6.0
Occupational epidemiology	13.3	14.2	17.9	11.1
Occupational health	3.3	4.4	3.6	5.0
Other	1.7	2.2	12.5	9.5
Psychosocial factors	8.3	13.1	14.3	30.7
Respiratory disorders	8.3	5.5	8.9	5.5
Toxicology	8.3	8.2	5.4	5.5
Work physiology	15.0	13.1	1.8	0.5

<sup>a</sup> For articles published in 2003.

<sup>b</sup> For articles published in 2004.

ago, Peter Lawrence, a molecular biologist in Cambridge in the United Kingdom published an often-quoted commentary in *Nature* on the politics of publication (1). His commentary was part of a lively debate on the tyranny of impact factors (2). In essence, the impact factor is regarded as inappropriate for the judgment of the quality of single articles, let alone individual scientists. Bibliometric research has shown again and again that the citation rate for individual papers is essentially uncorrelated to the impact factor of the journal in which the papers were published.

The analysis presented is certainly not intended to argue that the impact factor should determine the editorial policy of the Journal. The best policy is obviously to attract high-quality papers that contribute to the progress in understanding the importance of determinants of occupational health and the cost effectiveness of available interventions. Contributions to the *Scandinavian Journal of Work, Environment & Health* will be evaluated on their scientific quality and usefulness to the field. Good articles will attract readers and citations and thus, in an indirect way, contribute to the prestige of the Journal.

#### *References*

1. Lawrence PA. The politics of publication. *Nature*. 2003;422: 259–61.
2. Colquhoun D. Challenging the tyranny of impact factors. *Nature*. 2003;423:479.

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