



## **Editorial News**

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by [O'Donoghue-Lindy L](#), [Burdorf A](#), [Viikari-Juntura E](#)

**Affiliation:** Scandinavian Journal of Work, Environment & Health, FI-00250, HKI, Finland. [lodo@ttl.fi](mailto:lodo@ttl.fi)

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## What attracts citations? A look back at *Scandinavian Journal of Work, Environment & Health* papers over the past five years

Most if not all of our readers will be familiar with the impact factor: the average number of times articles published in the last two years have been cited in a given year (1). For all its criticisms, the impact factor continues to be a vital measure of a journal's citation rate and, hence, a proxy for the relative significance of that journal within its field. Considering how important it is for smaller scientific journals to understand which topics attract readership and citations, we decided to evaluate which areas of research performed above average with respect to citations. A similar assessment was undertaken three years ago when Burdorf & Viikari-Juntura (1) analyzed how papers published in the *Scandinavian Journal of Work, Environment & Health* were cited in the shorter and longer run. At that time, they found that musculoskeletal disorders, psychosocial factors, and occupational epidemiology were the major research areas, with the first two categories representing the largest contribution to citations. We focused on the last five years (2006–2010) as this was where the previous analysis left off.

A key difference between the current analysis and that of Burdorf & Viikari-Juntura is that the latter published data only relating to those citations occurring two years after the item's publication date (ie, impact-factor relevant citations). As many citations often occur in the 3<sup>rd</sup> and 4<sup>th</sup> year post-publication, we included all citations found in Web of Science in the last five years in order to gain a broader picture of topic relevance.

Using the same classification as earlier (1), we found some interesting developments. As shown in table 1, the top three most-cited categories continue to be (in hierarchical order) psychosocial factors, occupational epidemiology, and musculoskeletal disorders, with the last two representing the two most frequently published areas. Although it makes a smaller contribution to the overall manuscript count (10.6%), the psychosocial factors topic represents a substantial number of citations (29.3%).

Occupational health continues to be important, garnering almost 11% of all citations, in close proportion to the number of papers published, followed closely by work physiology at 9%. The latter had the lowest share of citations in the last analysis (1). The increased interest in work physiology can be traced to a new emerging area. Not previously categorized separately, shift work (including night work) falls under several categories (eg, occupational epidemiology, psychosocial factors and exposure

assessment) but a large number of papers have been in the area of work physiology. Many shift work papers have focused equally on cancer, reflecting the debate on the decision of International Agency for Research on Cancer (IARC) to classify shift work as probably carcinogenic in humans.

Although there is overlap between the topics, if shift work and cancer had been included as *separate* categories of research (ie, irrespective of which general classification they fall under), from 2006–2010 they would have been the third (12.2%) and sixth (10.5%) most-cited topic, respectively (data not shown). These citations rates are in direct proportion to the share of shift work and cancer papers published during the same period [11.2% and 10.2%, respectively]. In 2010, papers published under a shift work theme (2) were responsible for 45% of all citations to papers published in the course of 2010, despite the fact that citations usually do not occur in the same year of publication. In 2009 and 2008,

**Table 1.** Relative distribution of articles and citations according to topic, listed in order of citation rate between 2006–2010.

Classification <sup>a</sup>	2003 <sup>a</sup>	2004–2005 <sup>a</sup>	2004 <sup>a</sup>	2005–2006 <sup>a</sup>	2006–2010	
	Published items (%)	Citations (%) <sup>b</sup>	Published items (%)	Citations (%) <sup>c</sup>	Published items (%)	Citations (%) <sup>d</sup>
Psychosocial factors	13.3	15.8	14.3	30.7	10.6	29.3
Occupational epidemiology	13.3	14.2	17.9	11.1	28.6	20.9
Musculoskeletal disorders	20.0	27.3	19.6	20.6	13.9	11.3
Occupational health	3.3	4.4	3.6	5.0	11.2	10.8
Work physiology	15.0	13.1	1.8	0.5	9.2	9.1
Other	3.4	2.2	12.5	9.5	8.8	8.7
Occupational economics	1.7	1.6	3.6	6.0	5.1	4.4
Exposure assessment	6.7	2.2	10.7	4.0	4.4	2.6
Toxicology	8.3	8.2	5.4	5.6	5.1	1.6
Respiratory disorders	8.3	5.5	8.9	5.5	3.1	1.3
Indoor air	6.7	5.5	1.8	1.5	0	0

<sup>a</sup> Taken from Burdorf & Viikari-Juntura (1).

<sup>b</sup> For items published in 2003.

<sup>c</sup> For items published in 2004.

<sup>d</sup> For items published 2006–2010, includes citations to items published in 2010, which normally tend to be low and therefore depresses the overall citation rate slightly.

shift work was the third most cited category, a trend already visible in 2007, with a review on shift work and the risk of ischemic heart disease (3) and several articles (4–12) attracting strong citations. The citation rate for cancer papers, although high, is, however, slightly skewed as some papers attracted a disproportionately large number of citations (10, 13–17).

In a similar fashion, sick absence was an area of research not previously classified as a topic in its own right but rather falling under occupational epidemiology or occupational health, depending on the focus. The topic represented 4.3% of citations in 2005–2006 to items published in 2004, with a share of only 1.6% of total papers (data not shown). In recent years, this subject has seen an increased number of papers (18–28), that continue to attract citations in proportion to the amount published (3.9% of citations and 3.7% of total items). Although still small in terms of its share in the number of papers and citations (2.4% and 2.7%, respectively for 2006–2010), return to work is another not-previously-classified subject that has grown in interest, with two papers in this issue (29, 30) and three (31–33) in recent years, including one well-cited review (34).

Interest in occupational economics has been relatively constant but we are interested to see how the Journal's special theme on this topic (35, 36) will fair in terms of citations. The number of published papers on exposure assessment, respiratory disorders, toxicology, and particularly indoor air has fallen in recent years as have their share of citations. Notably, manuscripts that are not easily classified ("other" in our classification), tend not to be cited, with a few exceptions (37), including, ironically, a paper on citation classics which has itself been relatively highly cited (38).

Like the previous assessment, this analysis shows that reviews continue to be popular, accounting for only 10% of published items but 25% of total citations during 2006–2010 (table 2). The top two most-cited items were reviews (39, 40), one of which would already be classified as a "citation classic" in the field of occupational health according to Gehanno et al (38). These reviews included a meta-analysis, and it seems that a quantitative

summary on the strength of the association between risk factors and work-related health problems attracts specific attention amongst peers.

Already many articles are being cited during the year of publication indicating the importance of advanced online-access to articles prior to publication. The *Scandinavian Journal of Work, Environment & Health* has made considerable effort to improve free and early access to authors' material as this allows more time for papers to be cited and increases the timeliness of research. By the end of September 2010, 25% papers had already garnered citations, many in advance of print publication, which – although such citations do not contribute to the Journal's impact factor – is an indication of the effectiveness of *Online First* in making research available in a timely and efficient manner and good news for authors who focus on the citation index of individual papers.

Another interesting aspect of our findings was that with very few exceptions, every article that has been given open access status (either as an *Editor's Pick*, *top-cited article* or via payment of our open access fee) has been cited (data not shown). Open access essentially means "free availability and unrestricted use" (41). For the top-cited articles, clearly providing open access has not necessarily played a great role in increasing citations as these articles were already considered important subjects to be cited (8, 17, 37, 42, 43). However, for more recent papers where access is limited, it is interesting to note already the number of citations (3, 44–47). Indeed, research has shown that articles available online with unrestricted access have higher impact rates than proprietary online and print articles (48).

While this analysis is sensitive to a relatively small number of papers, it nevertheless gives a good indication of emerging trends and topics that continue to be of high relevance. It also provides important guidance for our editorial staff in terms of improving recognition of those manuscripts that will provide value for the scientific community at large and continue to attract readers of the Journal.

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

Type	2006–2010			
	Total published	%	Total citations	%
Reviews	29	9.9	362	24.7
Editorials	31	10.5	54	3.7
Articles	212	72.1	1029	70.2
Other <sup>a</sup>	22	7.5	21	1.4

<sup>a</sup> Discussion papers, case reports, commentary, short communications

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Lisa O'Donoghue-Lindy, Managing Editor [lodo@ttl.fi]  
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