



Letter to the editor

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Japanese journals also have their citation classics in occupational medicine

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I read with interest an article in your journal by Gehanno et al (“Citation Classics in Occupational Medicine Journals”) (1). In their paper, the authors describe 20 citation classics from five large journals in the field of occupational medicine. The first large study of “citation classics” was published 20 years ago by Eugene Garfield, and it described 100 such articles from the *Journal of the American Medical Association* (2). A more-recent list of citation classics from journals across all scientific fields has been published elsewhere (3).

Citation counting, like impact factors in general, remains a hot topic for debate in almost all research fields. On one hand, some authors have obtained cult-like status from a single publication. A 1951 article from Oliver Lowry (4), for example, remains the most popular scientific article of all time, having received almost 300 000 citations by 2005 (3). Similarly, Albert Einstein had been cited almost 12 000 times by 2001 (5). On the other hand, however, Albert Sabin’s landmark article describing a live Polio vaccine (6) had received just over 90 citations by the late 1980s (2). Even Eugene Garfield’s 1955 article (7) that actually proposed the idea of citation counting and journal impact factors did not rise to become his most highly cited work (8). Furthermore, of the 38 million citable items published between 1900 and 2005, less than 1% was cited more than 200 times, and half were not cited at all (9). As such, it can be seen that most authors can probably never expect to publish what will become super-cited papers or “citation classics”. To a large extent, this situation occurs because different fields have intrinsically different citation rates (10), and the size of a research field itself tends to limit the number of super-cited papers it will ever contain (11). In small disciplines such as occupational health, then the number of super-cited papers will not only be limited, but the absolute number of citations each paper ever receives will also be small when compared with the number cited in other, more popular, areas such as cancer research or general medicine. (12)

Because trends clearly change over time, it is difficult to establish at exactly what threshold a super-cited paper should begin to be counted. Garfield, for example, suggested that, in 1955, a scientific article with 250 citations could be deemed a “classic”, whereas the threshold might have risen to 400 by 1975, and to 1000 by 1995 (11). By setting their threshold at 100 citations, Gehanno and his colleagues (1) located 85 classics from five, large

occupational medicine journals, although the top-cited paper had received fewer than 1000 citations and only four had been cited over 300 times. There was also evidence of citation clustering at the lower end of the scale, with most articles (68%) having been cited between 100 and 150 times (1). Similarly, in Garfield’s 1987 article on citation classics in a general medical journal (2), the citation count ranged from 158 to 705, with most (57%) having only been cited between 50 and 74 times. As such, it can clearly be shown that the arbitrary assignment of 100 citations as a cutoff value would undoubtedly miss a certain proportion of important articles in the occupational medicine field. This phenomenon has also been demonstrated in other research fields such as taxonomy, a discipline that is not highly cited (13) but still has its own classic articles (14). Another issue is geographic bias, given the general overrepresentation of citations originating from Western countries (15).

In this regard, it is worth noting that Japanese journals also have their citation classics in occupational medicine, and I would like to draw your attention to them. While there are currently two ISI-listed periodicals in this field, only one has a sufficiently long history to have generated any “classic” articles. The journal *Industrial Health* was founded in 1963 as the only English-language periodical from Japan publishing exclusively in the field of occupational and environmental health (16). The other Japanese periodical, the *Journal of Occupational Health*, has only published in English since 1996. According to Lundberg (17), it is difficult to assess the historical impact of any article less than 15 years old. As shown in table 1, only eight articles published in Japanese occupational medicine journals have risen to become “classics” in the past 45 years, and none had received over 100 citations.

A few key findings from this list are apparent, however. First, it can be seen that all classic Japanese articles had focused on occupational toxicology, environmental exposure, or animal experimentation or related topics. Second, as all of them had been published over 24 years ago, the lag time for occupational medicine research in Japan, as elsewhere in the world, is clearly long. Such a situation probably occurs because many workplace diseases tend to have relatively long latency periods between exposure and the onset of clinical disease. Therefore, research findings are rarely cited in the first few years after publication, if at all, simply because

Table 1. Japanese citation classics in the field of occupational medicine.

Article	Times cited	Rank
Yoshikawa H. Preventive effect of pretreatment with low dose of metals on the acute toxicity of metals in mice. <i>Ind Health</i> . 1970;8:184–91.	84	1
Kumai M, Koizumi A, Saito K, et al. A nationwide survey on organic solvent components in various solvent products. part 2: heterogeneous products such as paints, inks and adhesives. <i>Ind Health</i> . 1983;21:185–97.	82	2
Fukuda K, Takemoto K, Tsuruta H. Inhalation carcinogenicity of trichloroethylene in mice and rats. <i>Ind Health</i> . 1983; 21: 243–54.	82	3
Inoue T, Takeuchi Y, Hisanaga N, et al. A nationwide survey on organic solvent components in various solvent products. part 1: homogeneous products such as thinners, degreasers and reagents. <i>Ind Health</i> . 1983;21:175–83	81	4
Suzuki T, Matsumoto N, Miyama T, et al. Placental transfer of Mercuric Chloride, Phenyl Mercury Acetate and Methyl Mercury Acetate in mice. <i>Ind Health</i> . 1967;5:149–55.	72	5
Suzuki S, Taguchi T, Yokohashi G. Dietary factors influencing upon the retention rate of orally administered ¹¹⁵ mCdCl ₂ in mice. <i>Ind Health</i> . 1969;7:155–62	58	6
Suzuki Y, Yoshikawa H. Role of metallothionein in the liver in protection against Cadmium toxicity. <i>Ind Health</i> . 1974;12:141–51.	52	7
Yamauchi H, Yamamura Y. Dynamic change of inorganic arsenic and methylarsenic compounds in human urine after oral intake as arsenic trioxide. <i>Ind Health</i> . 1979;17:79–83.	50	8

their relevance to human health is not immediately apparent (12).

There are also other issues to consider. Previous authors have commented that the relatively low impact factor of occupational medicine journals, for example, may be due in part to impact factor calculations only having a 2-year citation counting period (18, 19). Such a hypothesis supports the observations of Gehanno and his colleagues (1), for which the most frequently cited paper in their list was 47 years old. Second, although the overall citation counts tended to be relatively small, a few selected articles in the Japanese literature in occupational medicine appear to have received the bulk of citations for that journal. Third, similar to the case of Albert Sabin, at least one key Japanese scientist went unrecognized from a citation perspective. Despite being recognized as an influential figure in occupational cancer research, with his photo even appearing on the cover of the March 1990 issue of *Cancer Research* (20), Hiroyuki Sakabe and his landmark 1973 article on lung cancer (21) was not destined to become highly cited.

One significant obstacle to increasing the number of citation classics from Japan, as elsewhere, is prestige. Given that the strongest predictor of yearly citations has been shown to be the impact factor of the journal in which it was originally published (22), it is not surprising that many occupational medicine researchers may tend to overlook dedicated periodicals when deciding where to send their manuscripts. Given the relative paucity of citations, researchers may simply opt to publish the bulk of their work in general medical journals with intrinsically higher impact factors (12). In an earlier study, for example, McCunney & Harzbecker (23) demonstrated that occupational medicine journals were 50 times more likely to cite the general medical literature, than vice versa. This finding suggests that, while general medicine may attract the attention, and hence the

citations, of researchers in occupational medicine, the reverse is seldom true.

There is a bright side, however. While the overall citation counts received by dedicated journals in occupational medicine are clearly small, their contribution to human health and scientific enlightenment should not be underestimated. Similarly, occupational medicine is the child of many parents (24), and its ubiquity in the scientific world is undoubtedly increasing. The number of articles coded for the word “occupational” for example, increased from around 24 000 in the 1970s to 36 000 in the 1980s and then to approximately 53 000 in the 1990s (25). Furthermore, as Gehanno and his colleagues (1) pointed out, super cited papers also serve an important educational role for the next generation of occupational health researchers. Recognizing, quantifying, and documenting citation classics from Japan, as elsewhere, will clearly lead to greater enlightenment on what articles, topics, and persons really are influencing the world of contemporary human health.

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