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A ranking of safety journals using different measurement methods

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ABSTRACT

Using an online survey, we asked safety researchers around the globe how they perceived the quality of a list of 35 representative safety journals. We found that the most well-respected journal by expert opinion was the Journal of Loss Prevention in the Process Industries. However, taking both the respondents' results and the citation-based results into consideration, the Journal of Hazardous Materials is the most influential journal, followed by Reliability Engineering and System Safety, Risk Analysis, Accident Analysis and Prevention and Safety Science.

1. Introduction

Many academic journals exist and it can be quite difficult to gain notion of the relative quality of any journal compared with other journals in one research field. This is certainly also the case in the field of safety research. Many safety-related journals are available and publishing in one journal may be regarded as more important by peers, or may have a higher research impact, than publishing in another journal. To help authors and readers of state-of-the-art safety research and recent safety studies to decide which journal to publish in or simply to read, a variety of journal quality assessment methods have been developed. The most well-known method is undoubtedly the so-called 'journal impact factor' (or ISI impact factor) published by Thomson Scientific. The ISI impact factor is a quantitative instrument to evaluate scientific journals, determined by the average number of citations to an article published during the 2 years preceding the year in which the impact factor is being calculated. The more articles from a certain journal are cited, the higher its impact factor. It is common knowledge in the scientific research community that journals with high impact factors are perceived as more important than those with lower or no impact factors. Moreover, this performance measure is also regularly employed by universities, public and private research foundations, and various institutions to assess researchers, research projects, research proposals (and their teams), etc. Hence, publishing in scientific journals with high impact factors is, amongst others, important for the esteem and making promotion in the academic world, as well as in some industrial settings, and it is also essential for decision-makers deciding about research funding. The importance of the latter factor may be reflected into the knowledge that decisions affecting hundreds of millions of euros for research purposes worldwide at least partially depend on impact factor assessments. Therefore, it is an interesting exercise to compare the impact factor ranking with other measurement methods and evaluate whether the impact factor is an adequate proxy of journal quality.

Several studies concerning the use and the design of impact factors, their improvement and conceptual modeling have been performed. The reader is for example referred to Yue and Wilson (2004), Moed (2005), Frandsen et al. (2006), Kodrzycki and Yu (2006), and Egghe et al. (2007).

Overall, it should be noted that assessing and ranking journals is a difficult task, since journal quality is composed of different domains. Roughly, either the number of citations (as mentioned in the paragraph before), or expert perceptions, are used to rank journals. This paper investigates and compares these two types of ranking. Such an exercise is interesting, since authors' expert opinions may be different from the 'generally accepted' citation-based assessments to take decisions for evaluating researchers, authors, projects, etc. After all, assessments might not only want to take objective output-related concepts such as the volume and intensity of citations into account, but also subjective opinion-related factors (Rousseau, 2008). This way, a more correct picture of the true

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quality of a safety-related journal is acquired. For example, some journals are more industry-oriented and therefore do not display high impact factors but are very highly regarded by the readership of safety journals, whereas other journals may display high impact factors, but are hardly read and/or appreciated by safety experts.

This article uses a survey to identify researchers' perceptions on the quality of safety journals. The Spearman's rank correlation test is used to this end. We also controlled for a potential bias, caused by the relative representation of the different nationalities (Europe, North-America and the Rest of the World). Furthermore, our paper investigates the level of correlation between the expert opinions rankings and the ISI impact factors rankings.

2. Methodology

Based on internet and literature, a list of safety journals was drafted. We limited the list to journals which are situated within the same research field, that is general safety journals and process safety journals, for the respondents of the survey to be able to compare them. For example, food safety journals or IT safety journals were not included in the list. The safety journal list is given in Table 1.

Table 1 also displays the 2009 impact factor, as well as the 5-year impact factor of the journals. The journal's abbreviation used throughout this article, is provided in the list.

Authors that published in any journal of the list 2 years prior to the study, were seen as possible respondents of the survey. A database of electronic author addresses (available online) was then composed, whereby authors could be linked to universities, research centers, industry, etc. The survey was electronically sent on 22 November 2010 to 826 researchers spread out all over the world. Table 2 illustrates the distribution of survey copies sent out in the world.

Table 2
Distribution of survey copies sent out worldwide.

	Number of e-mails sent (absolute number)	Share of total (%)
Africa	7	00.84
Asia	149	18.04
Europe	312	37.78
North-America	321	38.86
Oceania	26	03.15
South America	11	01.33
Total	826	100

To increase the response rate of the survey, a reminder was sent on 14 February 2011. The respondents were asked to indicate for 35 journals (see Table 1) whether they considered the journal to belong to the top or subtop in the field of safety. We did not include an explicit definition of what constitutes a top or subtop journal and thus allow each expert to form his/her own opinion. This is standard practice in perception-based studies since these differences in opinion are exactly what such studies wants to uncover. The respondents needed to assess journals with a score of 1 ('Top'), 2 ('Subtop'), or 3 ('Other').

3. Results

The results of the survey are presented in this section. On March 15, 2011, 68 answers were received, representing a response rate of 8.23%. In spite of the initial expectations and novelty of Web-based surveys that led to high response rates (in many cases much higher than traditional survey methods such as postal or telephone

Table 1
Safety journal list used in the survey.

Journal	Abbrev.	5-year Impact factor	
Accident Analysis and Prevention	AAP	1.647	2.167
American Society of Safety Engineers Journal	ASSEJ	–	–
Chemical Engineering Progress	CEP	0.515	0.415
Chemical Health and Safety	CHS	–	–
Clean Technologies and Environmental Policy	CTEP	1.016	–
Disaster Advances	DA	0.138	–
Disaster Prevention and Management	DPM	–	–
Ecotoxicology and Environmental Safety	EES	2.133	2.674
Environmental Health Perspectives	EHP	6.191	7.103
Environmental Progress and Sustainable Energy	EPSE	–	–
Fire Safety Journal	FSJ	1.259	1.384
Health, Risk and Society	HRS	1.328	1.588
Human and Ecological Risk Assessment	HERA	1.528	1.311
International Journal of Emergency Management	IJEM	–	–
International Journal of Environmental Health Research	IJEHR	1.066	1.214
International Journal of Environmental Research and Public Health	IJERPH	0.781	0.790
International Journal of Reliability, Quality and Safety Engineering	IJRQSE	–	–
International Journal of Risk Assessment and Management	IJRAM	–	–
Journal of Cleaner Production	JCP	1.867	2.105
Journal of Contingencies and Crisis Management	JCCM	–	–
Journal of Environmental Health Research	JEHR	0.817	0.812
Journal of Hazardous Materials	JHM	4.144	4.360
Journal of Loss Prevention in the Process Industries	JLPPI	0.810	1.014
Journal of Occupational Safety and Ergonomics	JOSE	0.407	–
Journal of Risk Research	JRR	0.569	0.987
Journal of Safety Research	JSR	1.340	1.617
Open Occupational Health and Safety Journal	OOHSJ	–	–
Process Safety and Environmental Protection	PSEP	1.124	1.019
Process Safety Progress	PSP	0.452	0.541
Professional Safety	PS	–	–
Reliability Engineering and System Safety	RESS	1.908	2.305
Risk Analysis	RA	1.953	2.474
Risk Management	RM	–	–
Safety Science	SS	1.220	1.426
Stochastic Environmental Research and Risk Assessment	SERRA	1.419	1.395

Table 3
Distribution of respondents over the continents.

	Number of responses received	% of Total number of responses	Response rate continent (%)	Response rate total (%)
Africa	1	01.47	14.29	00.12
Asia	10	14.71	06.71	01.21
Europe	36	52.94	11.54	04.36
North-America	18	26.47	05.61	02.18
Oceania	1	01.47	03.85	00.12
South-America	2	02.94	18.18	00.24
Total	68	100	–	8.23

Table 4
Survey ranking results (number of counts).

Journal	Top	Subtop	Other	Unknown/no appreciation
JLPPI	37	9	6	16
JHM	30	12	7	19
RESS	25	11	4	28
SS	24	16	10	18
RA	19	14	9	26
AAP	18	17	10	23
JSR	18	17	9	24
PSEP	16	20	3	29
PSP	15	22	6	25
FSJ	13	17	12	26
JRR	13	17	9	29
CEP	11	18	13	26
CHS	10	16	9	33
JOSE	10	13	12	33
ASSEJ	9	13	11	35
EHP	9	10	17	32
DPM	9	9	16	34
OOHSJ	9	6	16	37
IJRAM	7	17	11	33
IJRQSE	7	14	14	33
RM	7	11	14	36
EES	6	11	14	37
JCP	6	10	17	35
PS	6	9	16	37
IJEHR	4	13	17	34
HERA	4	10	17	37
HRS	4	9	19	36
SERRA	3	14	16	35
IJEM	3	12	19	34
IJERPH	3	9	19	37
EPSE	2	11	18	37
JEHR	2	10	20	36
DA	2	8	19	39
CTEP	1	10	20	37
JCCM	1	9	21	37

surveys), response rates have fallen in an alarming manner in the past decade (Dillman et al., 2010; Frippiat and Marquis, 2010). Hence, the response rate we obtained in our study is acceptable given the fact that response rates for academic studies have been known to show a decline in recent years. However, low response rates are a concern for researchers since answers from survey respondents may differ substantially from those of non-respondents, resulting in a biased estimate of the characteristics of the population (Bean and Roszkowski, 1995). Nonetheless, as noted in Section 2, in our case, the questionnaire was sent – worldwide – to authors publishing in any of the studied journals in the last 2 years, to guarantee the representativeness of the sample, and to ascertain that the results are not tainted by information bias. Table 3 presents the distribution of respondents over the continents.

The largest share of respondents are situated in Europe (53%), followed by North-America (26%), and the Rest of the World (21%). Table 4 offers the survey results and ranks the journals according to its number of 'Top' answers. In case of an equal number of 'Top' answers, the 'Subtop' rankings were considered. If the latter number is identical as well, the 'Other' counts were taken into account.

Table 4 shows that *Journal of Loss Prevention in the Process Industries* is the journal most valued by safety experts, followed by the *Journal of Hazardous Materials*, and *Reliability Engineering and System Safety*. The top 5 of journals valued by the respondents is completed by *Safety Science* and *Risk Analysis*.

We further asked the respondents to indicate whether they wanted to add journals to the list we proposed (see Table 1). The majority of respondents (51 out of 68) did not have any journals to add. Hence, 75% of respondents assessed the list to be representative. 17 respondents suggested in total 33 extra journals. Table 5 lists the proposed extra journals.

The journals in Table 5 are ranked based on the number of respondents that have referred to that particular journal. We also added information on whether the journals are listed in the (social) science citation index (SSCI and SCI) and what their 2009 impact factor is, if they are included in the index. Remarkable is that 40% of the journals that are mentioned are not included in the science or social science citation indices. From the original list, some 30% of the journals had no impact factor. This observation indicates that the list of safety journals monitored by Thomson Scientific is obviously far from complete.

Since 75% of the respondents found the presented list of 35 journals representative, and since only one extra journal was three times mentioned, four journals were two times mentioned, and all other extra journals were only once mentioned, we may conclude that the original list of 35 journals can be considered representative for our objective to compare rankings of journals using different measurement methods.

4. Discussion

We compared the different journal rankings to identify whether they are correlated or not, using the Spearmans rank correlation test. Our zero hypothesis for the test is:

H_0: Both rankings are not correlated.

Comparing the survey ranking results with the 2009 impact factor ranking results, Spearmans rank correlation test indicates that both rankings are not correlated within the 5% level of confidence interval ($\rho_S = 0.332$, with $t = 2.022 < 2.042$). If we compare the ranking based on the experts' survey with the 5-year impact factor ranking, the test indicates that within a 95% confidence interval, both rankings are correlated ($\rho_S = 0.423$, with $t = 2.682 > 2.042$). Hence, it seems that the experts' ranking is long-term based, and that journals which were able to build a certain relative reputation during many years, translate this reputation into the relative perceived quality by safety experts. The difference between the 2009 IF ranking and the 5-year IF ranking may, amongst others, result from the fact that in case of some journals, no 5-year impact

Table 5
List of suggested extra journals.

Journal	Number of times mentioned	2009 Impact factor
International Journal of Hydrogen Energy	3	3.945
Applied Ergonomics	2	1.105
Combustion and Flame	2	2.923
Journal of Risk and Reliability	2	–
Loss Prevention Bulletin	2	–
American Industrial Hygiene Association Journal	1	–
Chemical Engineering Journal	1	
Cognition, Technology & Work	1	–
Combustion, Explosion and Shock Waves	1	0.547
Construction Management and Economics	1	–
Energy Policy	1	2.436
Environment International	1	4.786
Fire and Materials	1	1.196
Human Factors and Ergonomics in Manufacturing & Service Industries	1	0.426
IEEE Transactions on Reliability	1	1.331
Injury Prevention	1	1.453
International Journal of Environment and Health	1	–
International Journal of Injury Control and Safety Promotion	1	–
International Journal of Occupational and Environmental Health	1	1.120
International Journal of Performability Engineering	1	–
Journal of Forensic Sciences	1	1.524
Journal of Occupational Health Psychology	1	2.351
Journal of Occupational Health and Safety, Australia and New Zealand	1	–
Journal of Thermal Analysis and Calorimetry	1	1.587
Journal of Transportation Safety & Security	1	–
Nuclear Engineering and Design	1	0.785
Proceedings of the Combustion Institute	1	3.256
Propellants, Explosives, Pyrotechnics	1	0.870
Safety Science Monitor	1	–
Theoretical Issues in Ergonomics Science	1	–
Thermochimica Acta	1	1.742
Traffic Injury Prevention	1	–
Work & Stress	1	2.310

factor was available and in other cases, there was a large difference between the 2009 impact factor and the 5-year impact factor due to a sharp difference in number of citations.

The differences between the survey ranking and the impact factor rankings can also be explained. Researchers have specific preferences with respect to the journals they would like to publish in, the publications that should be taken into account when evaluating job candidates, the journals which are highly specific for certain domains of expertise or for specific research fields, availability of journals, frequency of journal publication, type of profession of researcher, etc. Axarloglou and Theoharakis (2003) for example found significant variation between different researchers in assessing the quality of a journal. According to these authors, the variation depends amongst others on geographical location, field of expertise, way of thinking of the alma mater of the researcher, and focus and orientation of recent research. Evidently, these factors do not always coincide with a journal's impact factor.

If we compare the journals with respect to their ranking in different parts of the world, large differences, at least at first glance, can be observed. As already mentioned, we divide the world into three segments: Europe, North-America and the Rest of the World (ROW). Table 6 provides an overview of the rankings for the different world segments.

The Worldwide ranking from Table 6 is correlated with each of the three world segment rankings, that is, the Europe ranking ($\rho_S = 0.837$; $t = 8.787 > 2.042$), the North-America ranking ($\rho_S = 0.639$; $t = 4.772 > 2.042$), and the ROW ranking ($\rho_S = 0.799$; $t = 7.633 > 2.042$), within the 95% confidence interval. However, when we compare the segments with each other, different results are observed. The North-America and Europe rankings are uncorrelated ($\rho_S = 0.333$; $t = 2.029 < 2.042$), as well as the North-America and the ROW rankings ($\rho_S = 0.291$; $t = 1.747 < 2.042$). Finally, the

Table 6
Journal rankings of the different world segments.

Journal	Worldwide	Europe	North-America	ROW
JLPPI	1	1	11 + 1/2	2
JHM	2	2	11 + 1/2	3
RESS	3	3	24	1
SS	4	4	5 + 1/2	8
RA	5	5	17	5
AAP	6	7	4	14
JSR	7	12	2	4
PSEP	8	8	9 + 1/2	9
PSP	9	9	5 + 1/2	18
FSJ	10	6	26	15
JRR	11	10	16	18
CEP	12	11	31	10 + 1/2
CHS	13	19	1	20 + 1/2
JOSE	14	13	14	16
ASSEJ	15	16	9 + 1/2	18
EHP	16	26	3	28
DPM	17	15	8	25
OOHSJ	18	34	7	12 + 1/2
IJRAM	19	28	19	6 + 1/2
IJRQSE	20	18	21	12 + 1/2
RM	21	29	21	6 + 1/2
EES	22	17	18	25
JCP	23	14	29 + 1/2	20 + 1/2
PS	24	27	15	25
IJEHR	25	30	13	32
HERA	26	24	27	22 + 1/2
HRS	27	31	34	10 + 1/2
SERRA	28	21	25	29
IJEM	29	20	29 + 1/2	27
IJERPH	30	24	23	32
EPSE	31	33	33	22 + 1/2
JEHR	32	24	28	32
DA	33	35	21	34
CTEP	34	32	32	30
JCCM	35	22	35	35

Table 7
Results of Chi-square statistics for the combinations of world segment rankings.

Journals (out of 35 journals in total) of which the quality was significantly differently assessed in different world segments, controlled by using Chi-square tests (with a 95% confidence interval)					
Europe/North-America	Europe/ROW DA	North-America/ROW	Europe/North-Am. ± ROW	ROW/Europe + North-Am.	North-America/Europe + ROW
CHS	EPSE	IJEM	CHS	EPSE	CHS
DA	HERA	JCP	DA	HRS	DA
DPM	HRS		EHP	IJERPH	DPM
EHP	IJERPH		HERA	IJRAM	EHP
IJEHR	IJRAM		HRS	JCP	IJEHR
JHM	IJRQSE		IJEHR	JEHR	JHM
JLPPI	JCP		IJRAM	RM	JLPPI
JSR	JEHR		IJRQSE		OOHSJ
OOHSJ	OOHSJ		JEHR		PS
PS	PS		JHM		RESS
RESS	RM		JLPPI		
			OOHSJ		
			PS		
			RM		

Table A1
Chi-square test results on contingency tables EUR/N-A.

Journal	χ^2-Test statistic	5% (5.99)
JCCM	0.63	Do not reject
PSEP	0.63	Do not reject
EPSE	0.68	Do not reject
SS	0.70	Do not reject
JEHR	0.81	Do not reject
SERRA	1.07	Do not reject
AAP	1.10	Do not reject
JOSE	1.16	Do not reject
HRS	1.46	Do not reject
RA	1.66	Do not reject
PSP	1.89	Do not reject
IJERPH	2.04	Do not reject
JCP	2.22	Do not reject
CTEP	3.03	Do not reject
IJRQSE	3.04	Do not reject
HERA	3.10	Do not reject
JRR	3.17	Do not reject
IJEM	3.26	Do not reject
CEP	3.52	Do not reject
FSJ	4.07	Do not reject
RM	4.69	Do not reject
ASSEJ	5.04	Do not reject
EES	5.30	Do not reject
IJRAM	5.88	Do not reject
JSR	6.07	Reject
DA	6.51	Reject
JHM	8.22	Reject
RESS	8.57	Reject
DPM	9.52	Reject
EHP	9.79	Reject
IJEHR	10.11	Reject
CHS	10.25	Reject
JLPPI	12.07	Reject
OOHSJ	12.91	Reject
PS	14.88	Reject

Table A2
Chi-square test results on contingency tables EUR/ROW.

Journal	χ^2-Test statistic	5% (5.99)
RA	0.00	Do not reject
RESS	0.05	Do not reject
JRR	0.10	Do not reject
FSJ	0.37	Do not reject
JOSE	0.50	Do not reject
PSEP	0.63	Do not reject
CEP	0.69	Do not reject
PSP	1.29	Do not reject
JSR	1.50	Do not reject
SERRA	1.60	Do not reject
DPM	1.91	Do not reject
JCCM	2.02	Do not reject
CTEP	2.57	Do not reject
EES	2.58	Do not reject
ASSEJ	2.59	Do not reject
JHM	2.73	Do not reject
AAP	2.74	Do not reject
SS	2.77	Do not reject
JLPPI	3.53	Do not reject
IJEM	3.62	Do not reject
CHS	3.65	Do not reject
EHP	3.98	Do not reject
IJEHR	4.17	Do not reject
JCP	6.08	Reject
DA	6.16	Reject
IJRQSE	6.68	Reject
IJERPH	7.34	Reject
JEHR	7.34	Reject
PS	7.38	Reject
HERA	7.77	Reject
EPSE	8.06	Reject
OOHSJ	8.09	Reject
HRS	10.96	Reject
RM	11.66	Reject
IJRAM	13.09	Reject

Europe ranking is correlated with the ROW ranking ($\rho_S = 0.579$; $t = 4.079 > 2.042$). Looking at combinations of world segments in combination with single segments, we found the following results. The Europe ranking and the cluster 'North-America + ROW' ranking are correlated ($\rho_S = 0.555$; $t = 3.833 > 2.042$), as well as the ROW ranking and the cluster 'North-America + Europe' ranking ($\rho_S = 0.372$; $t = 2.302 > 2.042$). Also the North-America ranking and the cluster 'Europe + ROW' ranking were correlated ($\rho_S = 0.393$; $t = 2.455 > 2.042$). The Spearman's rank correlation test results show that scientific journals' quality is significantly differently assessed in North-America compared to the other world segments. However, by taking the Europe ranking together with the ROW ranking, a cluster ranking was created with which the North-America ranking was not uncorrelated anymore. It thus seems that the different world segments do not assess journal quality in a different way.

We further investigated more in depth the differences of quality assessment by the world segments, by drafting 2×3 contingency tables of each journal to test whether different combinations of single segment rankings and cluster rankings value the journals in an equivalent manner, and by using a Chi-square test. Our zero hypothesis for the test is:

H_0: The journal's quality is equally assessed by both world segments.

Table A3
Chi-square test results on contingency tables N-A/ROW.

Journal	χ^2-Test statistic	5% (5.99)
PSEP	0.00	Do not reject
SERRA	0.04	Do not reject
JOSE	0.15	Do not reject
PSP	0.30	Do not reject
IJRQSE	0.43	Do not reject
JCCM	0.43	Do not reject
SS	0.46	Do not reject
ASSEJ	0.48	Do not reject
EES	0.77	Do not reject
HERA	0.79	Do not reject
OOHSJ	1.06	Do not reject
RA	1.22	Do not reject
JHM	1.23	Do not reject
IJRAM	1.39	Do not reject
CTEP	1.43	Do not reject
JRR	1.77	Do not reject
JLPPI	2.16	Do not reject
RM	2.27	Do not reject
FSJ	2.73	Do not reject
PS	2.99	Do not reject
DA	3.21	Do not reject
JSR	3.30	Do not reject
JEHR	3.45	Do not reject
CHS	3.62	Do not reject
EPSE	3.74	Do not reject
HRS	4.47	Do not reject
EHP	4.68	Do not reject
AAP	4.78	Do not reject
CEP	5.20	Do not reject
IJEHR	5.20	Do not reject
DPM	5.33	Do not reject
RESS	5.42	Do not reject
IJERPH	5.53	Do not reject
IJEM	7.89	Reject
JCP	9.82	Reject

We use the 95% confidence interval for the Chi-square tests. Table 7 gives an overview of the results of these tests. The individual tables with the results of the various Chi-square tests are provided in the Appendix.

Table 7 denotes that the quality of some journals is indeed significantly differently assessed in different parts of the world. It is important to note, however, that the number of journals being differently valued by safety experts in different parts of the world, is rather limited in every combination of world (single and cluster) segment rankings (ranging from 6% to 40%), and that the different evaluations of journals did not have an effect on the overall rankings (that is, all cluster rankings were correlated with the single segment rankings, see before).

Concluding this section, from a statistical point of view, the expert ranking and the 5-year IF ranking are indistinguishable and can be aggregated without difficulty. Using these two rankings, a top five of most influential journals in safety research can be composed (adding the rank positions of the two lists and determining the top 5 journals of this new list): (i) *Journal of Hazardous Materials*, (ii) *Reliability Engineering and System Safety*, (iii) *Risk Analysis*, (iv) *Accident Analysis and Prevention*, and (v) *Safety Science*. The new ranking is based on objective as well as subjective criteria, adding to the quality assessment's validity of the journals mentioned.

5. Conclusions

We investigated safety journals' quality by using two different measurement methods: one based on perception of safety researchers, and one based on the number of citations to journals (reflected by the journal's impact factor). Although the ranking ob-

Table A4
Chi-square test results on contingency tables EUR/N-A + ROW.

Journal	χ^2-Test statistic	5% (5.99)
CEP	0.35	Do not reject
AAP	0.43	Do not reject
RA	0.59	Do not reject
IJEM	0.70	Do not reject
JCP	0.90	Do not reject
PSEP	0.91	Do not reject
JOSE	1.18	Do not reject
JRR	1.54	Do not reject
SERRA	1.97	Do not reject
FSJ	2.00	Do not reject
JCCM	2.03	Do not reject
PSP	2.17	Do not reject
SS	2.32	Do not reject
RESS	3.22	Do not reject
CTEP	3.36	Do not reject
JSR	3.95	Do not reject
IJERPH	4.39	Do not reject
EPSE	4.90	Do not reject
DPM	5.03	Do not reject
EES	5.48	Do not reject
ASSEJ	5.57	Do not reject
JEHR	6.16	Reject
IJRQSE	6.22	Reject
JHM	6.37	Reject
HERA	7.47	Reject
HRS	7.58	Reject
DA	7.61	Reject
EHP	8.51	Reject
IJEHR	8.71	Reject
CHS	8.89	Reject
RM	9.00	Reject
JLPPI	9.95	Reject
IJRAM	10.56	Reject
OOHSJ	12.63	Reject
PS	14.31	Reject

Table A5
Chi-square test results on contingency tables N-A/EUR + ROW.

Journal	χ^2-Test statistic	5% (5.99)
SS	0.10	Do not reject
RM	0.26	Do not reject
JCCM	0.31	Do not reject
PSEP	0.32	Do not reject
SERRA	0.40	Do not reject
IJRAM	0.40	Do not reject
HERA	0.55	Do not reject
IJRQSE	0.62	Do not reject
EPSE	0.75	Do not reject
JOSE	0.78	Do not reject
JEHR	0.80	Do not reject
PSP	1.29	Do not reject
RA	1.77	Do not reject
HRS	1.81	Do not reject
AAP	2.33	Do not reject
CTEP	2.69	Do not reject
ASSEJ	3.26	Do not reject
JRR	3.10	Do not reject
EES	3.51	Do not reject
IJERPH	4.01	Do not reject
CEP	4.24	Do not reject
FSJ	4.53	Do not reject
JCP	4.78	Do not reject
IJEM	4.81	Do not reject
JSR	5.33	Do not reject
JHM	6.33	Reject
OOHSJ	7.05	Reject
DA	7.06	Reject
RESS	9.29	Reject
DPM	9.72	Reject
PS	9.74	Reject
CHS	9.84	Reject
EHP	10.13	Reject
JLPPI	10.63	Reject
IJEHR	13.06	Reject

Table A6
Chi-square test results on contingency tables ROW/EUR + N-A.

Journal	χ^2-Test statistic	5% (5.99)
JRR	0.02	Do not reject
JOSE	0.11	Do not reject
RA	0.12	Do not reject
PSEP	0.32	Do not reject
JHM	0.39	Do not reject
RESS	0.39	Do not reject
FSJ	0.63	Do not reject
PSP	0.66	Do not reject
ASSEJ	0.71	Do not reject
EES	0.74	Do not reject
JSR	0.90	Do not reject
SERRA	0.93	Do not reject
JLPPI	1.39	Do not reject
OOHSJ	1.64	Do not reject
JCCM	1.73	Do not reject
PS	1.93	Do not reject
CEP	1.97	Do not reject
DPM	2.07	Do not reject
SS	2.19	Do not reject
CHS	2.34	Do not reject
CTEP	2.61	Do not reject
EHP	3.47	Do not reject
AAP	4.28	Do not reject
IJRQSE	4.71	Do not reject
IJEHR	4.72	Do not reject
HERA	5.47	Do not reject
DA	5.50	Do not reject
IJEM	5.97	Do not reject
JEHR	7.53	Reject
RM	9.00	Reject
IJERPH	9.05	Reject
EPSE	9.16	Reject
JCP	9.43	Reject
IJRAM	9.83	Reject
HRS	13.19	Reject

tained from safety experts (indicating the 'perceived quality' of the journals) was positively correlated with the ranking based on 2009 impact factors (indicating the 'objective quality' of the journal), tests show that the two rankings differ significantly. The expert based ranking was also positively correlated with the 5-year impact factor ranking, whereby these two rankings did not significantly differ (using a 0.95 confidence interval).

We showed that the results are not biased by the respondents from one of the world segments, since the evaluation of the listed journals is statistically identical in any of the three cases where clusters of world segment rankings are used (Europe + North-America/Europe + ROW/North-America + ROW) and compared with single segment rankings (Europe/North-America/ROW). More detailed analysis suggests that the valuation of some individual journals might be different between continents.

We finally drafted a top five of most influential journals by using both the quality as perceived by safety researchers on the one hand and the objective quality measured by numbers of citations on the other hand as quality measurement criteria.

Appendix A. Individual tables with the results of the various Chi-square tests

See Tables A1–A6.

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