Acta Ophthalmologica

Shared burden is always lighter – Peer-review performance in an ophthalmological journal 2010–2020

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ABSTRACT.

Purpose: **There are concerns in the academic publishing community that it is becoming more difficult to secure reviews for scientific manuscripts. This study examines trends in editorial and peer review processes in an ophthalmological journal over the last decade.**

Methods: **A retrospective analysis was performed of editorial data from the journal Acta Ophthalmologica containing all manuscript submissions between 2010 and 2020.**

Results: **The number of yearly submissions grew between 2010 and 2019 from 1014 to 1623, and in 2020, the number of submissions increased to 2449. In total, the number of submissions increased by 142% between 2010 and 2020. Similarly, the proportion of desk-rejected manuscripts increased from 48% to 67% during the period 2010–2020. The number of invitations needed to obtain one review showed an increase from 1.9 to 2.6 between 2010 and 2019, but remained stable between 2019 and 2020. However, the number of reviewers per reviewed manuscript, reviewed manuscripts per reviewer and time from invitation to completed review assignment remained almost constant between 2010 and 2020. Researchers based in North American were disproportionally often invited to review (18%) compared to their share of published articles (7%), and they also declined review invitation more frequently compared to scholars in other parts of the world.**

Conclusions: **The study revealed an increase in submitted manuscripts to an ophthalmological journal over the last decade, with a further increase during the COVID-19 pandemic. The number of reviewer invitations needed to obtain one review grew during the study period but remained constant between 2019 and 2020, despite a vast increase in submitted manuscripts. Hence, the burden for unique reviewers did not increase. Instead, the proportion of desk-rejected manuscripts grew, and the reviewer pool expanded, which allowed the annual average number of reviews by individual reviewers to remain stable.**

Key words: reviewers – academic journal – reviewer fatigue – scholarly communication – authorship – editorial boards – pandemic – peer review – desk rejection

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Introduction

Peer review is the main process for quality assurance and improvement in academia. Basically, all scientific publishing is subjected to peer review in some form. Its current practice was established relatively late, with leading journals adopting contemporary polices during the latter part of the 20th century (Csiszar 2016). Even if the system has been subjected to criticism for being conservative (hindering the emergence of new ideas), slow (delaying dissemination of new findings) and biased in terms of gender, seniority and nationality (Bornmann 2011), peer review remains the golden standard for upholding scientific quality and rigour. Researcher attitudes towards peer review are also often positive (Tennant 2018).

Despite its importance for the scientific community peer review is time-consuming, uncompensated and an extracurricular activity that give no real credit to the reviewer. Hence, the growth in scientific production has resulted in an increasing demand for peer review, which is difficult, or even unsustainable for the scientific community to handle (Kovanis et al. 2016; Severin & Chataway 2021). This problem is commonly labelled as reviewer fatigue and could both delay publication and reduce the quality of published manuscripts. Recent initiatives, such as Publons (2021), have been launched with the purpose of attributing credit to reviewers, thus providing further incentives for taking on review

assignments. Still, the average number of invitations per received review is increasing in several fields (Didham et al. 2017; Fox et al. 2017). There are many possible motivations for researchers to decline invitations to review. In one study, of more than 700 American researchers who gave a reason for not taking on peer review assignments, the most common was 'too busy' (35%) followed by 'too many other review invitations' (20%) and 'not sufficiently expert' (11%) (Breuning et al. 2015). However, data supporting reviewer fatigue has been sparse in the biomedical literature, and no studies have yet been published on this matter in the field of ophthalmology.

The purpose of this study was to examine trends in journal submissions and peer review processes in an ophthalmological journal during the last decade.

Method

Acta Ophthalmologica is a peer-reviewed medical journal of ophthalmology established in 1923. It is published eight times per year by John Wiley & Sons on behalf of the Acta Ophthalmologica Scandinavica Foundation (Acta Ophthalmologica 2021), and it is the official journal of the Nordic and Dutch Ophthalmological Societies and the European Association for Vision and Eye Research. The impact factor of the journal increased from 2.8 in 2010 to 3.4 in 2019 (Clarviate Analytics, 2021a, 2021b).

We used editorial data provided by the journal covering the years 2010–2020.

This included all submissions to the journal: original manuscripts, reviews, letters to the editor and case series. Each record included the year of submission, location and the anonymized identity of the reviewer, if a review was performed, time from invitation to complete review and the final editorial decision. An invited reviewer was defined as a person receiving at least one review request and an active reviewer as a person generating at least one review during a certain year. The analysis focussed on the number of yearly submissions, the rate of rejection and acceptance, the proportion of peer-reviewed manuscripts, the number of invited/active reviewers, requests per performed review, the number of active reviewers for each reviewed manuscript and average time from reviewer invitation to completed review. We also calculated the proportion of reviews performed by active reviewers completing more than one review per year. Finally, we analysed invitations, complete assignments, and the national and regional affiliation of reviewers. In addition to the data obtained from the journal, we downloaded records from *Web of Science* for information on the location of first or corresponding authors publishing articles (excluding editorials or letters) in the journal for the period 2010–2020 (Clarviate Analytics, 2021a, 2021b). To relate peer review performance to articles published in the journal, we also compiled the number of original articles for the time frame, distinguishing between printed and online only (Acta Ophtahlmologica). As our study looked at the whole population of interest, it was not meaningful to perform statistical tests of significance.

Results

The database contained 15 516 original submissions to Acta Ophthalmologica between 2010 and 2020. The number of yearly submissions showed a steady increase from 1014 in 2010 to 1623 in 2019, an increase of 60%. Between 2019 and 2020, the number of submissions rose with a further 51% to 2449. In total, the number of submissions increased by 142% between 2010 and 2020 (Fig. 1). The proportion of manuscripts subjected to peer review in relation to total submissions decreased from 43% to 29% between 2010 and 2019 but remained stable at around 30% between 2019 and 2020 (Table 1).

In the studied period of 2010–2020, 75% of the manuscripts were rejected. Of these discarded texts, 58% were rejected by the editorial board before being subjected to external peer review. The total proportion of accepted manuscripts was 21%. A further 4% were in production, withdrawn or had not been revised by their authors within the given time frame (Fig. 2). During 2010–2019, the number of accepted manuscripts decreased from 23% to 18% and further declined to 14% between 2019 and 2020. The proportion of rejected manuscripts increased from 73% to 79%, and the proportion rejected by the journal's editor increased from 48% to 67% (Fig. 3).

The number of invitations needed to obtain one review showed an increase from 1.9 to 2.6 between 2010 and 2019 but remained stable between 2019 and 2020. The number of active reviewers per reviewed manuscript and invitations per active reviewer was almost constant during the entire study period (Fig. 4). Likewise, the proportion of active among invited reviewers and the average number of days from invitation to submitted review to be completed remained relatively stable (Table 1). Invited reviewers were less likely to complete a review the more the requests they received (Fig. 5). The proportion of accepted manuscripts did not differ between manuscripts requiring 1–2 invitations to obtain a complete review and manuscripts requiring more than 2 invitations to secure a review (47% in both cases).

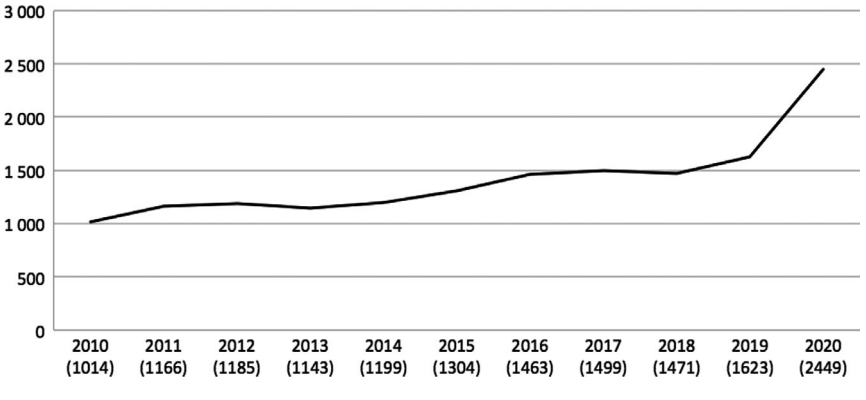

Figure 1. Submitted manuscripts to Acta Ophthalmologica 2010–2020. The exact number of submitted manuscripts is shown in parenthesis.

Table 1. Peer reviewer activity for Acta Ophthalmologica 2010–2020

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Peer-reviewed manuscripts of all submitted	43%	48%	45%	32%	36%	41%	37%	29%	27%	30%	29%
Unique invited reviewers	1011	1238	1234	1022	1185	1466	1663	1542	1487	1727	2427
Unique active reviewers	559	677	652	508	562	723	739	618	594	695	980
Reviews	792	993	939	653	758	957	968	785	720	881	1352
Request/Reviewer	1.5	1.5	1.5	1.3	1.4	1.4	1.3	1.3	1.3	1.3	1.5
Average days from invitation to complete review	21	21	21	20	18	19	19	19	20	19	18
Proportion of active among invited reviewers	23%	25%	23%	17%	23%	19%	20%	18%	14%	18%	22%

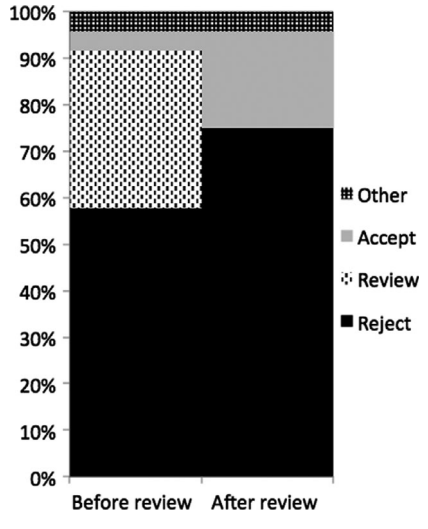

Figure 2. Decisions for manuscripts submitted to Acta Ophthalmologica 2010–2020 before and after peer review.

The Nordic region had the greatest number of invitations/reviewer (6.2) and the highest proportion of complete reviews per invitation (63%). Conversely, North America had both the lowest number of invitations/ reviewer (1.9) and the lowest proportion of complete review/invitation (29%). The most common location for published authors was Europe (67%) followed by Asia (22%) and North America (7%) (Table 2).

The number of published original articles increased from 177 in 2010 to 225 in 2020, resulting in a total increase of 27%. During the same interval, the proportion of online-only articles grew from 34% to 61% (Fig. 6).

Discussion

The observation that it is becoming harder to find reviewers is also confirmed in the field of ophthalmology, as the mean number of requests per finished review in our data set rose from 1.9 to 2.6 between 2010 and 2020. These numbers correspond with earlier findings from studies in the field of ecology and evolution showing an increase from 1.8 to 2.8 between 2003 and 2015 (Fox et al. 2017). A journal of insect biodiversity displayed a parallel development from 1.8 invitations to 2.3 between 2009 and 2015 (Didham et al. 2017), and a large report undertaken by Publons, a service including more than 11 000 academics worldwide to track their reviews, showed an increase from 1.9 in 2013 to 2.4 in 2017 (Publons 2018).

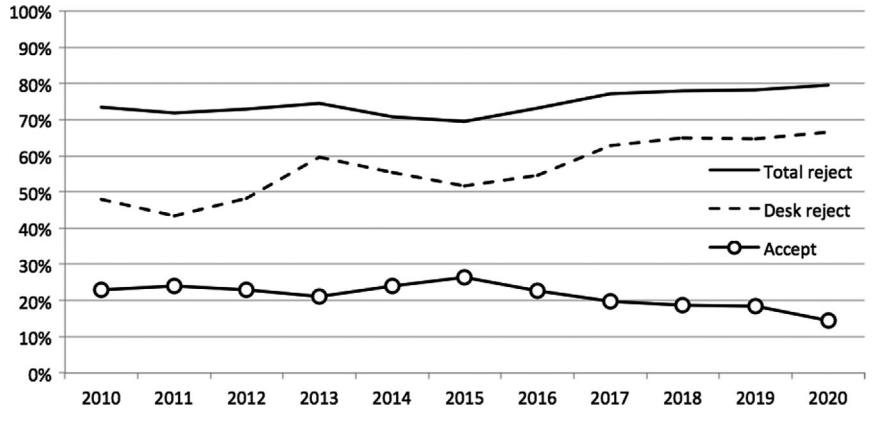

Figure 3. Proportion of accepted and rejected manuscripts in Acta Ophthalmologica 2010–2020.

Another finding of interest was the increase in editorial rejections (desk reject) from 48% to 67% between 2010 and 2020. Due to a 142% growth in submissions accompanied by a more modest increase in published original articles (27%), the editors have constrained the number of manuscripts entering the peer-reviewed process. This means that the pool of reviewers only had to handle one third of the increase in yearly submitted manuscripts, a number that rose from 1014 to 2449. Similar trends have been reported in previous research, with a rise of desk rejection in recent years (Garcia et al. 2021), a number that tripled with some journals (Lewin 2014). The transition from printed to online-only articles follows a pattern in the global scientific community (Klus & Dilger 2020).

The increase in submitted manuscripts during 2020 could partially be explained by the COVID-19 pandemic. During this year, many scholars seem to have shifted their attention from clinical projects to data analysis and manuscript preparation. Scholars have observed a general increase in submissions concerning 'non-COVID' research during 2020 (Else 2020; Fox & Meyer 2021). Yet, we could not find that the number of requests for review issued per complete review increased during 2020, nor did reviewers need more time to complete their task. Instead, the reviewer pool expanded, allowing the average annual number of reviews by individuals to remain almost constant. Hence, the number of review requests per person has not increased, at least not within this specific journal.

It is evident that Acta Ophthalmologica relies heavily on a core set of reviewers, which are predominately based in the Nordic region. As apparent from Table 2, these reviewers are much more likely to accept invitations

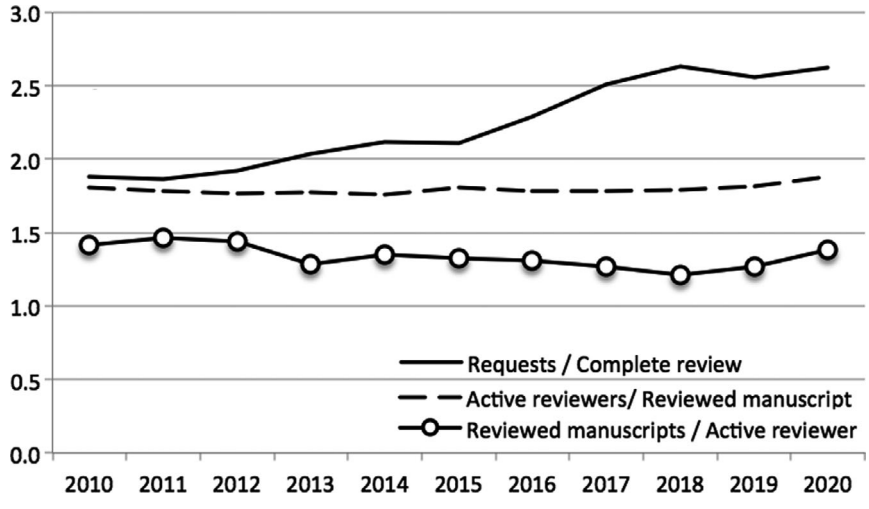

Figure 4. Reviewer activity for Acta Ophthalmologica 2010–2020.

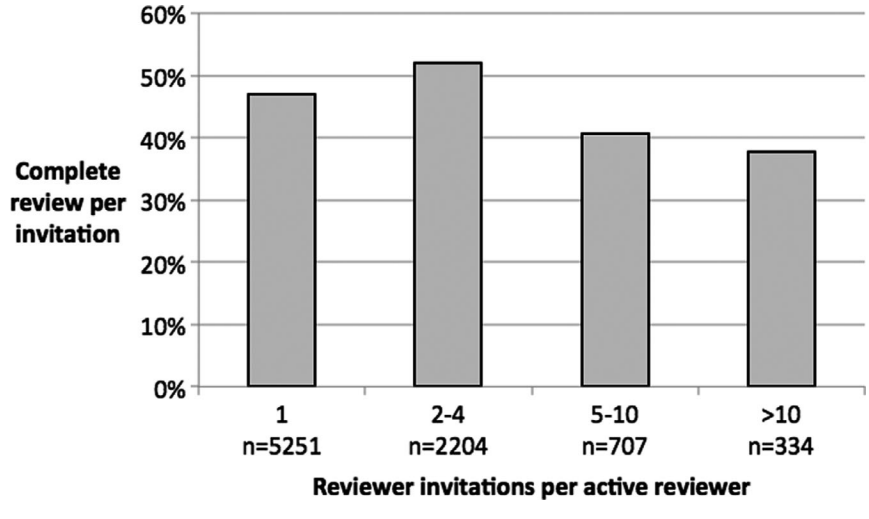

Figure 5. Complete review per invitation by number of invitations per invited reviewer in Acta Ophthalmologica 2020. The number of reviewers in each group is shown in parenthesis.

(63%), and they perform the task more frequently (receiving on average 6.2 invitations). This is likely to reflect the strong position of the journal in the Nordic community of ophthalmologists. These findings point in two directions. On one hand, it appears that extending the pool of reviewers is an effective strategy for handling an increasing number of submissions in need of review. On the other hand, it is evident that the journal is reliant on a core set of dedicated reviewers, who take on a large share of the review requests. When comparing the relationship between published articles and invitations to review, it appears that researchers in North American are disproportionally often invited to review (18%) compared to their share of published articles (7%). This might very well be an explanation for their reluctance to accept invitations. Similarly, researchers based in Asia are less likely to be invited to review (15%) in relation to their contribution in terms of published articles (22%). This is not a unique pattern for Acta Ophthalmologica, as similar distributions have been found in the field of medicine (Murray et al. 2018) and other areas (Burns & Fox 2017). Hence, a suggestion for upholding a fair, inclusive and efficient recruitment of reviewers would be to gradually increase the share of invitations to researchers based in Asia.

This is the first published study of reviewer performance in the field of ophthalmology. Other strengths are the relatively long period of analysis and the detailed information about submissions. However, an important limitation is that the analysis was based on data for only one journal, and variations exist among journals.

Overall, our data suggest that reviewer agreement rates have also declined in the field of ophthalmology. Future research could extend this type of analysis to a broader range of ophthalmologic journals and include more detail about reviewer and editorial characteristics to better control for these factors when making comparisons between journals and research fields.

Table 2. Peer review performance i Acta Ophthalmologica 2010–2020 from location of peer reviewers

	Invitations	Completereview/ invitation	Invitations/ reviewer	Reject	Number of published authors*
Nordic region	4806 (26%)	63%	6.2	29%	767 (23%)
Europe (Nordic region excluded)	7135 (38%)	49%	3.0	26%	1473 (44%)
North America	3287 (18%)	29%	1.9	23%	244 (7%)
Asia	2887 (15%)	46%	2.4	22%	733 (22%)
Australia (Oceania)	420 (2%)	44%	2.6	30%	87 (3%)
South America	197 (1%)	42%	2.1	29%	42 (1%)
Africa	25 (<1%)	40%	1.9	30%	34 (1%)

* Data extracted from Web of Science.

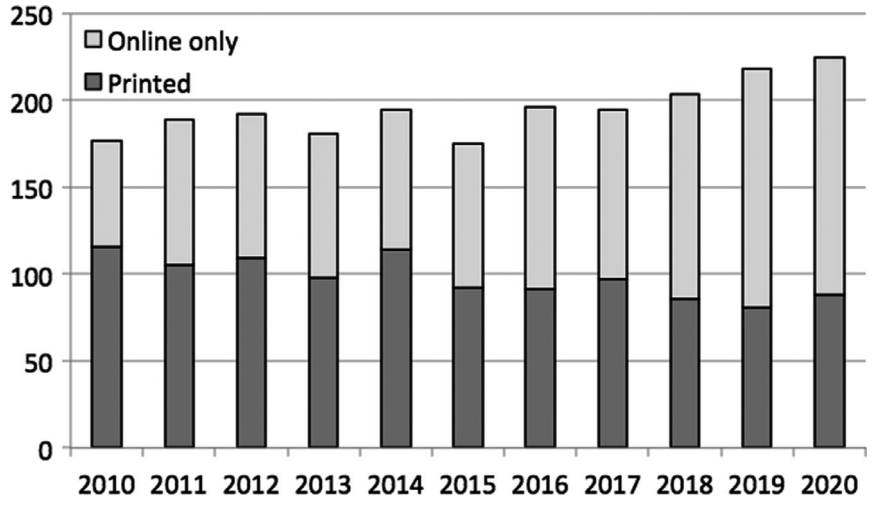

Figure 6. Number of published original articles in Acta Ophthalmologica 2010–2020 with distribution of printed and online only.

References

Acta Ophtahlmologica Issue archive. [WWW document]. https://onlinelibrary.wiley.com/loi/17553768 [accessed on 2021-06-30]

Acta Ophthalmologica (2021): Acta Ophthalmologica. [WWW document]. https://onlinelibrary.wiley.com/journal/17553768 [accessed on 2020-03-23]

Bornmann L (2011): Scientific peer review. Annu Rev Inform Sci Technol **45**: 197–245.

Breuning M, Backstrom J, Brannon J, Gross B & Widmeier M (2015): Reviewer fatigue? Why scholars decline to review their peers' work. PS Polit Sci Polit **48**: 595–600.

Burns CS & Fox CW (2017): Language and socioeconomics predict geographic variation in peer review outcomes at an ecology journal. Scientometrics **113**: 1113–1127.

Clarviate Analytics (2021): 2019 Journal Performance Data for: ACTA OPHTHALMOLOGICA. [WWW document]. https://clarivate.com/ [accessed on 2021-05-26]

Clarviate Analytics (2021): Core Collection, basic search. [WWW document]. https://clarivate.com/ [accessed on 2021-05-31]

Csiszar A (2016): Peer review: Troubled from the start. Nature **532**: 306–308.

Didham RK, Leather SR & Basset Y (2017): Don't be a zero-sum reviewer. Insect Conserv Divers **10**: 1–4.

Else H (2020): How a torrent of COVID science changed research publishing - in seven charts. Nature **588**: 553.

Fox CW, Albert AYK & Vines TH. (2017): Recruitment of reviewers is becoming harder at some journals: a test of the influence of reviewer fatigue at six journals in ecology and evolution. Res Integr Peer Rev **2**.

Fox CW & Meyer J (2021): The influence of the global COVID-19 pandemic on manuscript submissions and editor and reviewer performance at six ecology journals. Funct Ecol **35**: 4–10.

Garcia JA, Rodriguez-Sánchez R & Fdez-Valdivia J (2021): The editor-manuscript game. Scientometrics **126**: 4277–4295.

Klus MF & Dilger A (2020): Success factors of academic journals in the digital age. Business Res **13**: 1115–1143.

Kovanis M, Porcher R, Ravaud P & Trinquart L (2016): The global burden of journal peer review in the biomedical literature: strong imbalance in the collective enterprise. PLoS One **11**: e0166387.

Lewin A (2014): The peer-review process: the good, the bad, the ugly, and the extraordinary. Manag Organ Rev **10**: 167–173.

Murray D, Siler K, Larivière V, Chan WM, Collings AM, Raymond J & Sugimoto CR (2018): Gender and international diversity improves equity in peer review. bioRxiv: 400515.

Publons. (2018): Global State of peer review.

Publons (2021): Publons. [WWW document]. https://publons.com/about/home/ [accessed on 2021-05-25]

Severin A & Chataway J (2021): Overburdening of peer reviewers: A multi-stakeholder perspective on causes and effects. Learned Publishing (Early view). https://onlinelibrary.wiley.com/doi/full/10.1002/leap.1392 [accessed on 2021-09-30]

Tennant JP (2018): The state of the art in peer review. FEMS Microbiol Lett **365**.

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