



# Pandemic publishing: Medical journals strongly speed up their publication process for COVID-19

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## ABSTRACT

In times of public crises, including the current COVID-19 pandemic, rapid dissemination of relevant scientific knowledge is of paramount importance. The duration of scholarly journals' publication process is one of the main factors that may hinder quick delivery of new information. Following initiatives of medical journals to accelerate their publication process, this study assesses whether medical journals have managed to speed up their publication process for coronavirus-related articles. It studies the duration of 14 medical journals' publication processes both during and prior to the current pandemic. Assessing 669 articles, the study concludes that medical journals have indeed strongly accelerated their publication process for coronavirus-related articles since the outbreak of the pandemic: The time between submission and publication has decreased on average by 49%. The largest decrease in number of days between submission and publication of articles was due to a decrease in time required for peer review. For articles not related to COVID-19, no acceleration of the publication process is found. While the acceleration of the publication process is laudable from the perspective of quick information dissemination, it also may raise concerns relating to the quality of the peer review process and of the resulting publications.

## 1. BACKGROUND

The world is facing an unprecedented health crisis affecting nearly all parts of society. In these times, access to the most state-of-the-art scientific knowledge is paramount to tackling the crisis. Academic journals and scholarly publishers are hence called upon to make new knowledge openly available and deliver new insights quickly.

In the current COVID-19 era, it is clear that new knowledge is direly needed. Scientists all over the world have stepped in to do experiments, observational studies and new analyses to obtain relevant information. However fast we would like to have access to this information, the scientific method used to obtain it requires time. Drug trials and vaccine creations do not happen overnight (Thorp, 2020). However, once such information has been gathered, it needs to be disseminated to all those potentially in a position to use it, as quick as possible. Traditionally, scholarly journals have been one of the main outlets to facilitate this (Horbach & Halfman, 2018).

One of the factors possibly hindering quick delivery of new information through scholarly journals is the duration of their publication process. Through editorial assessment and peer

review, journals select which articles deserve to be published on their pages, ideally filtering out invalid, erroneous, or otherwise problematic research. Though celebrated as being one of the hallmarks of science, the peer review process is also regularly criticized. Commentators blame it for being inconsistent (Peters & Ceci, 1982), essentially flawed (Smith, 2006), biased (Teplitskiy, Acuna, et al., 2018), and—particularly relevant in these times of crisis—slow (Nguyen, Haddaway, et al., 2015).

Several studies have previously aimed to assess the typical duration of journals' publication process (Lin, Hou, & Wu, 2016; Tosi, 2009). In their analyses, researchers commonly distinguish two stages of this process: the review stage (the stage between article submission and formal acceptance) and the production stage (the stage between acceptance and final publication, either online or in print). In a meta-analysis including over 2,700 journal articles, Björk and Solomon (2013) find considerable differences in turnaround times (the period between submission and publication of a journal article, sometimes also called *publication delays*) between research disciplines. For biomedical journals, they find an average duration of the review stage of just over 4 months, while the production stage takes on average about 5 months. The latter stage can be shortened for some journals by implementing "online-first" initiatives. Clearly, such lengthy turnaround times are highly undesirable from the perspective of quick delivery of novel knowledge in light of the current health crisis.

Two major responses to circumvent long turnaround times can currently be witnessed. From an author perspective, commentators are reporting a sharp increase in the use of preprint servers. On these online platforms, authors upload their manuscript, making it publicly accessible immediately upon finalization of the text (Gunnarsdottir, 2005). Because no review, editorial assessment, or copyediting takes place, manuscripts can be made accessible without publication delay. However, as manuscripts are only reviewed once they are available for anybody to read and use, scholars warn of potentially incorrect results spreading without editorial assessment filtering them. In fact, several cases of invalid research regarding COVID-19 being published as preprints have already been reported (Heimstädt, 2020; Marcus & Oransky, 2020). Preprint servers are now trying to mitigate this by explicitly posting (health) warnings on their articles. It should be noted, though, that this is not specific to preprints, as journal articles can require postpublication corrections and retractions as well (Horbach & Halfman, 2019). Several articles related to COVID-19 have already gone through this process (Gautret, Lagier, et al., 2020).

From the publishers' side, many journals and publishers are currently modifying their editorial procedures and policies to warrant fast dissemination of relevant information (Redhead, 2020). For instance, *eLife* announced it would curtail requests for additional experiments during revisions, suspend its deadline for submitting revisions, and make the posting of preprints to bioRxiv or medRxiv the default for all *eLife* submissions. It would also specifically mobilize early-career researchers to become reviewing editors and reviewers to extend the journal's reviewer pool (Eisen, Akhmanova, et al., 2020). Similarly, *Nature* put out an open invitation to researchers with relevant expertise to review coronavirus-related papers over short time (*Nature*, 2020). Hence, journals and publishers are aiming to attract reviewers who can assist in the rapid publication of new findings that are relevant to tackle the health crisis. The *Medical Journal of Australia (MJA)* has drafted policies related to both preprints and rapid peer review, setting up "fast lanes" for coronavirus-related research:

The *MJA* has stepped up to play its part in meeting this crisis, including ultrarapid review of SARS-CoV-2 manuscripts and preprint publication of unedited papers, to ensure that the newest data and viewpoints are available as soon as possible. (Talley, 2020)

The *Royal Society Open Publishing* announced the establishing of a similar fast lane for their registered reports on coronavirus-related content. They have even gathered a group of 700 reviewers who have committed to review a paper in 24 to 48 hours when called up on (Brock, 2020). The journal also acknowledges a widely voiced concern related to these fast dissemination models: “The ultra-rapid review and publication model entails a risk of error, but sharing important information too slowly is a much greater hazard” (Talley, 2020).

In this article, we assess whether the scholarly publishing community has succeeded in speeding up the dissemination of coronavirus-related content. To do so, we mainly focus on the duration of journals’ publication processes both prior to and during the present pandemic. In addition, we briefly assess the use of preprint servers and the uptake of preprint articles in academic journals.

## 2. METHODS

For our analysis, we use a repository of coronavirus-related research articles established by the Centre for Science and Technology Studies (CWTS). The repository is based on databases of CORD-19, Dimensions, and the World Health Organization (WHO), and includes articles on COVID-19, SARS-CoV-2, and related (corona) viruses and infectious diseases. In particular, this means that the database contains journal articles and preprints that predate the current COVID-19 pandemic, as it also includes, for instance, articles on the 2002 SARS virus and disease. For brevity’s sake, all such articles will in the remainder of this article be described as “coronavirus-related” articles. A full description of the database as well as access to all relevant data is available (CWTS, 2020). Colavizza, Costas, et al. (2020) provide a description and analysis of parts of this database. All results in this article are based on the April 4, 2020 release of the database. We note that the majority of articles in the data set originate from the CORD-19 database. Some doubt has been raised about the relevance of some of this database’s articles to the current pandemic (Colavizza et al., 2020), but for our purposes, the scope of the database seems reasonable. Based on this data set, several analyses were performed.

### 2.1. Duration of Journals’ Publication Process

We analyzed the duration of the publication process, in number of days, for a sample of 529 journal articles. Of these, 259 articles were published during the present pandemic (i.e., from January 1, 2020) and 270 were published prior to the pandemic (i.e., before October 1, 2019). The dates January 1 and October 1 were chosen based on the first cases of COVID-19 appearing in China in November 2019. Hence, October 1 ensures that articles in the control group were published before the pandemic emerged, and January 1 allows for work to be done and submitted after the first cases appeared. The articles were published in 14 different journals. Journals were selected based on their number of articles both prior to and during the current pandemic as well as the availability of data on when articles were submitted, accepted, and published. We selected the 10 journals publishing most coronavirus-related articles in general, supplemented by the five journals publishing most coronavirus-related content since the start of the pandemic that make publication data (submission, acceptance, and publishing) available. One journal, *Viruses*, matches both criteria. The list of journals used in this analysis, including their number of articles, as well as the journals discarded because no data on submission, acceptance, or publication dates were available, is added as supplementary material A. From those journals, we sampled all articles published since the start of the pandemic and matched those to an equal number of articles published in the same journal prior to the pandemic to form a control group. If the control group had fewer articles, we used this number of articles and only selected the most recent articles after the pandemic began. If fewer than 10 articles were published after the start of the pandemic, we nonetheless sampled

**Table 1.** Duration of the publication process for coronavirus-related papers, distributed over Review stage (between submission and acceptance) and Production stage (between acceptance and publication). Data distinguishes between the period before and during the COVID-19 pandemic. All durations are given in days

Journal title	Number of articles			Number of days for publication—During pandemic					Number of days for publication—Before pandemic				
	During pandemic	Before pandemic	Total	Review stage	Production stage	Entire publication process	95% CI	Entire publication process	Review stage	Production stage	Entire publication process	95% CI	Entire publication process
<i>Archives of Virology</i>	9	10	19	127.1	70.1	197.2	162.0	232.4	122.6	37.9	160.5	107.0	214.0
<i>Eurosurveillance</i>	30	30	60	8.3	1.7	10.0	7.1	12.9	105.9	62.4	168.3	113.2	223.5
<i>International Journal of Infectious Diseases</i>	32	32	64	23.7	5.3	28.9	14.8	43.1	77.0	8.5	85.5	64.7	106.3
<i>Journal of Hospital Infection</i>	24	24	48	10.0	5.6	15.6	1.8	29.5	59.5	15.8	75.3	55.9	94.7
<i>Journal of Medical Virology</i>	13	13	26	10.3	4.9	15.2	11.8	18.7	107.3	64.4	117.3	56.0	178.7
<i>Journal of Virology</i>	4	10	14	37.0	41.5	78.5	19.6	137.4	61.5	77.9	139.4	119.5	159.3
<i>PLOS ONE</i>	14	14	28	183.3	25.9	209.2	153.9	264.5	230.9	25.9	256.7	164.2	349.2
<i>Scientific Reports</i>	14	14	28	147.9	18.4	166.4	133.0	199.7	216.7	57.9	274.6	197.2	352.1
<i>Travel Medicine and Infectious Disease</i>	45	45	90	12.6	2.7	15.3	8.8	21.9	91.5	5.1	96.6	71.9	121.4
<i>Vaccine</i>	9	10	19	148.2	22.7	170.9	114.0	227.7	154.3	14.5	168.8	96.3	241.3
<i>Veterinary Microbiology</i>	9	10	19	89.6	4.3	93.9	70.5	117.3	69.2	2.4	71.6	59.2	84.0
<i>Virology</i>	8	10	18	90.0	3.3	93.3	63.9	122.6	63.3	5.6	68.9	51.3	86.5
<i>Virus Research</i>	10	10	20	124.2	2.4	126.6	89.7	163.5	119.4	9.2	128.6	37.4	219.8
<i>Viruses</i>	38	38	76	32.5	4.2	36.7	28.6	44.8	33.3	3.7	37.0	30.1	43.9
Total	259	270	529	51.0	9.3	60.3	50.9	69.8	95.9	23.6	117.4	103.9	130.9

10 articles for the control group. For the control group, we sampled articles starting with publications in 2019 (but before October 1) and moving backwards, in order to make sure editorial policies most closely resemble those in the pandemic. Table 1 presents the list of journals used, including the number of articles sampled per journal. Information on the dates of submission, acceptance, and publication was manually retrieved from the journal’s website. Some journals distinguished between publication online and appearance in the print issue of the journal; for these journals we always selected the date of online publication. Other journals, for instance online-only journals, do not distinguish between these dates, and date of publication automatically refers to online publication.

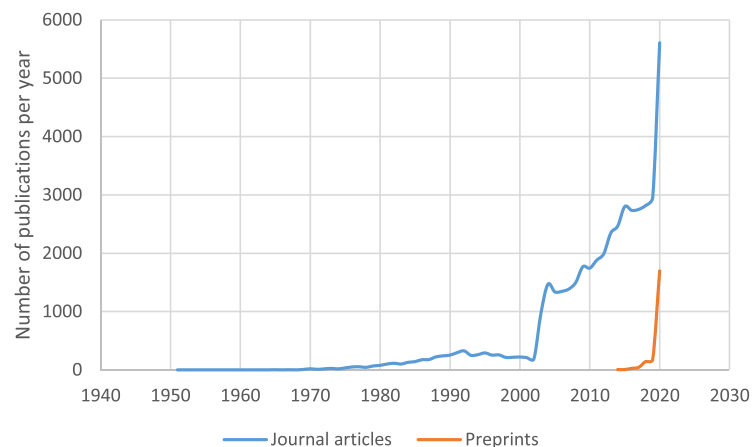
To control for potential effects specific to coronavirus-related papers, we selected, for all journals in our sample, the 10 most recently published articles (as of April 16, 2020) about noncoronavirus-related content. In particular, these were articles not present in our previous data set and articles not mentioning COVID-19, coronavirus, SARS-CoV-2, or Cov-19 in their title, keywords, and abstract. All the 140 articles in this control group were published during the current pandemic, with 64% published in April 2020, 32% in March, 1% in February, and 3% in January.

### 2.2. Posting of Preprints

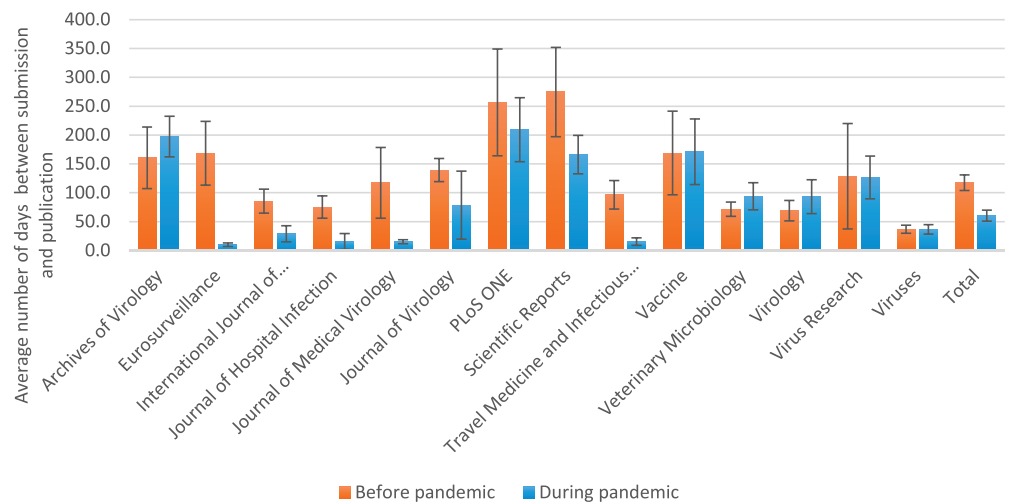
We assessed the usage of preprint servers as a fast way of disseminating academic knowledge by counting the number of preprints on coronavirus-related content both during and before the current pandemic. For this we used all preprints in the database, and did not use a more narrow sampling strategy. Hence, we include all coronavirus-related preprints. In addition, we analyzed the number of preprints that were also published as journal articles and the average number of days between posting of the preprint and the publication of the corresponding journal article. The analysis is based on the linkage of preprints and journal articles in the Dimensions Database (<https://docs.dimensions.ai/dsl/index.html>).

### 3. RESULTS

Figure 1 presents an overview of the number of journal articles and preprints per year in our data set. Unsurprisingly, it shows a sharp increase for both publication types since the outbreak of the current pandemic. However, earlier pandemics, such as the SARS outbreak in 2002, are clearly visible as well.



**Figure 1.** The number of journal articles and preprints related to COVID-19 per year in our database.



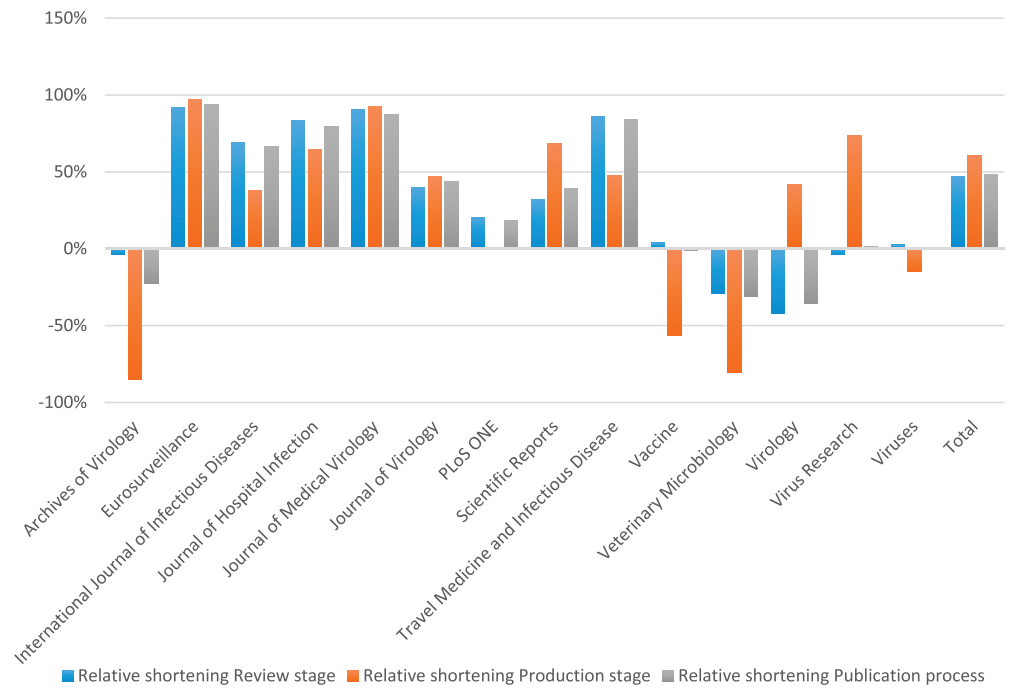
**Figure 2.** Average duration of the publication process for coronavirus-related papers in our sample of journals, as well as the total average over all journals (Total). Durations are given in number of days and distinguish between the period before and during the COVID-19 pandemic. Error bars represent the 95% confidence interval.

Figure 2 compares the overall duration of journals' publication processes prior to and during the present pandemic. It demonstrates that, on average, journals have strongly increased the speed of their processes for COVID-19 publications: The average turnaround time in our journal sample has decreased from 117 days to 60 days. Comparing the 95% confidence intervals of both statistics shows the decrease to be highly substantial and significant.

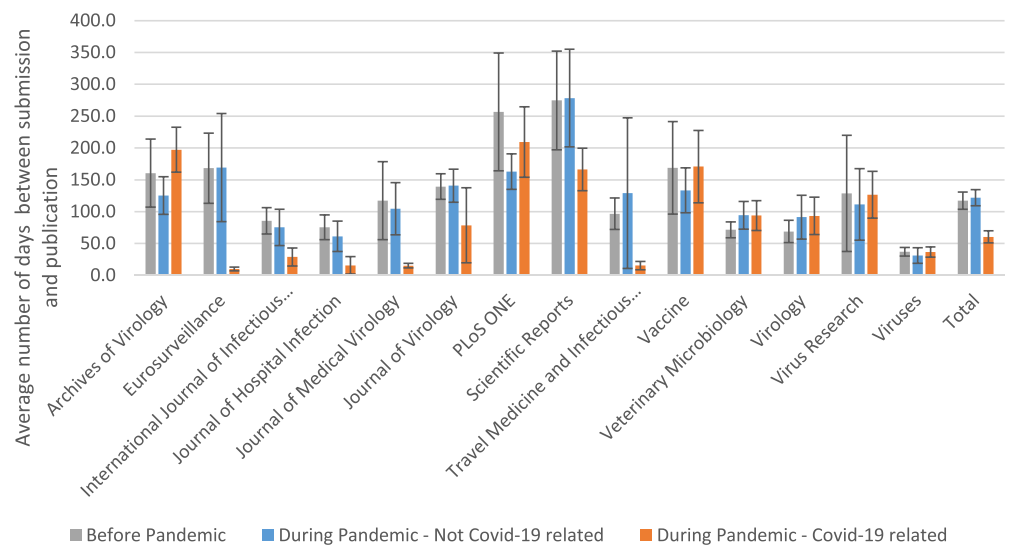
Table 1 presents descriptive statistics on the average duration of the publication process for coronavirus-related articles in journals in our sample. It distinguishes between the periods before and during the pandemic and it splits the entire publication process into the Review stage (between submission and acceptance) and Production stage (between acceptance and publication).

Figure 3 presents a graphical overview of the average decrease in turnaround time in the period during the crisis compared to the period prior to the pandemic. It again distinguishes between the Review and Production stages of the publication process. Note that negative numbers in this case indicate an *increase* in turnaround time. The figure indicates that the Review stage shortens for 10 of the 14 journals in our sample, while nine journals managed to shorten their Production stage. Average acceleration is around 50% for both stages, but it goes up to nearly 100% in some journals.

To check whether the acceleration of publication processes is specific to coronavirus-related papers, we analyzed the turnaround times for noncoronavirus-related articles published since the start of the pandemic. For all journals in our sample, we selected the 10 most recently published articles (as of April 16, 2020) about noncoronavirus-related content. In particular, these were articles not present in our previous data set and articles not mentioning COVID-19, coronavirus, SARS-CoV-2, or Cov-19 in their title, keywords, and abstract. For these articles we also analyzed the turnaround times of their publication process. The results are presented in Figure 4. The figure indicates that for most journals, articles not related to COVID-19 have very similar turnaround times to articles published before the pandemic. Unpacking the publication process in the Review and Production stage, we conclude that, again, noncoronavirus-related articles follow a very similar pattern to articles published before the pandemic.



**Figure 3.** Relative average decrease in time spend per journal on the Review stage, Production stage and Entire publication process in the journals of our sample, as well as for the total set of journals (Total). Decrease is measured as the shortening of duration in the pandemic era compared to the prepandemic era (i.e., negative values indicate an increase in duration during the pandemic compared to the period before the pandemic).



**Figure 4.** Average duration of the publication process for papers in our sample of journals, as well as the total average over all journals (Total). Durations are given for articles published before the pandemic and articles published during the pandemic, both those related to coronaviruses and those not related to coronaviruses. Durations are given in number of days. Error bars represent the 95% confidence interval.

**Table 2.** Average duration of the publication process for articles that previously appeared as preprints. Durations are given in number of days. The duration of the publication process is distributed over the Review stage (between submission and acceptance) and Production stage (between acceptance and publication). On top of the publication process, the table also indicates the average number of days between publication of the preprint and submission of the journal article

Journal title	Review stage	Production stage	Entire publication Process	Time from preprint publication to journal submission
<i>Journal of Virology</i>	55.6	70.7	126.4	25.4
<i>PLOS ONE</i>	126.6	21.9	148.5	8.6
<i>Scientific Reports</i>	105.3	16.3	121.6	56.1

As a brief addition to the above analysis, we now turn our analysis towards the posting of preprints. As was shown in Figure 1, the number of preprints on coronavirus-related content has seen a sharp increase since the outbreak of the pandemic. At the day of sampling, 2,102 preprints were posted on seven preprint servers: SSRN Electronic Journal, bioRxiv, ChemRxiv, JMIR Preprints, Research Square, and medRxiv. We note that even though arXiv publications are included in the Dimensions database, they are not included in the April 4 release of the data set we used, due to technical issues. Out of the 2,102 preprints in our data set, 129 have currently also appeared as journal articles. Due to the small number of preprints being published as journal articles, no statistically relevant conclusions can be drawn about the uptake of preprints in journals. However, analyzing the average duration between the posting of the preprint and the publication of the corresponding journal article we see a steady increase, ranging from, on average, 137 days in 2017 to just over 200 days in 2020. Currently, we do not see any indication of acceleration of the uptake of preprints in journals since the outbreak of the current pandemic. However, the sample is small and these statements should be treated with caution.

The 129 preprints were published in 68 different academic journals with only five journals publishing at least five preprints. The three journals publishing most preprints were *Journal of Virology*, *PLOS ONE*, and *Scientific Reports*, all of which are in our sample of journals used for the previous analyses. Hence, for the preprints in these journals, we can analyze the turnaround times of their publication process. The results are presented in Table 2.

All but one of these preprint-journal article pairs were published prior to the current pandemic. However, on comparing the results in Tables 1 and 2 it becomes clear that turnaround times for articles that previously appeared as preprints are much shorter than the average turnaround times in these journals. In fact, for these prepandemic articles, turnaround times are even shorter than their average postpandemic counterparts.

#### 4. DISCUSSION

To tackle the current health crisis, many have urged publishers to disseminate relevant academic knowledge as fast as possible. Acknowledging that common publication delays in medical journals are unacceptable in the current era, journals are expected to decrease the turnaround times of their publication process. The results of our study indicate that some journals have indeed managed to do so.

Our results on the average turnaround times of journal articles prior to the current pandemic correspond well with earlier findings of studies on publication delays in medical journals (Björk & Solomon, 2013). However, since the outbreak of the COVID-19 pandemic, medical journals



have managed to greatly accelerate their publication processes to make them nearly twice as fast for coronavirus-related articles. In contrast, articles not related to coronaviruses that were published since the beginning of the pandemic do not show any acceleration. Their turnaround times are similar to articles published before the pandemic.

While it seems reasonable that journals might encounter difficulties in attracting reviewers with relevant expertise—as those are probably active scientists working on novel research themselves—the opposite seems to be the case. From our results, it seems that journals are finding enough reviewers willing to review coronavirus-related papers at very short notice. However, this conclusion should be treated with caution, as no data is available on *who* reviewed the papers. Maybe the same few experts reviewed a lot more than usual; maybe “relevant expertise” was taken as a relative criterion, with journals using reviewers that usually would not have been considered experts. The fact that noncoronavirus-related papers are published at similar speeds during and before the pandemic seems to indicate that journals are also not facing more issues with attracting reviewers for those papers.

As preprint articles are not being included in medical journals more quickly, it seems that either authors are not submitting preprint articles to journals more quickly, or journals are prioritizing content that has not appeared as preprints. Qualitative follow-up research interviewing authors and editors on their submission and review practices regarding preprint articles could shed further light on this.

Some of the most prominent, high-impact medical journals are not part of our sample because they do not share all relevant data on submission, acceptance, and publication dates. Comparing the total number of published articles in high-impact journals such as the *British Medical Journal*, *The Lancet*, the *Journal of the American Medical Association* and the *New England Journal of Medicine* does not give a clear indication of faster publication: These four journals published 864, 421, 351, and 307 articles respectively in 2020, according to a Web of Science search. Over the same period in 2019 they published 874, 497, 335, and 334 articles respectively. Hence, most show a small decrease in the total number of published articles. Consequently, if they managed to speed up their publication process for coronavirus-related articles, this might have been at the expense of other content being published less, or less quickly. However, other factors might be at play as well, including a change in the volume of submissions during the COVID-19 pandemic (which could have impacted these journals in particular, as their authors may be practitioners at the sharp end of patient care) and page budget constraints.

Even though the acceleration of journals' publication processes is laudable from the perspective of quick information dissemination, it also raises several questions and concerns.

First, one may wonder whether faster is always better. Even though the two do not necessarily exclude each other, it seems reasonable that there is a balance, or perhaps even a trade-off, between speed and quality in peer review. At the review stage, especially, legitimate concerns can be raised about whether speeding up the review process might harm the process's ability to filter incorrect or invalid findings. Such research slipping through peer review might require corrections or retractions in the future. Given the potentially rapid uptake of medical knowledge in policy and clinical contexts, such corrections might come too late, as potential harm might already have been done. Commentators have raised this concern regarding the use of information in preprints, but it similarly applies to journal articles. In fact, false information spreading through journal articles is arguably more damaging, as it has the appearance of being “peer reviewed” and hence properly verified. Scholars have repeatedly warned that a substantial share of articles (hastily) published during this crisis will require future corrections (Marcus & Oransky, 2020). Formal expressions of concern about papers used to make policy decisions have already been issued (Voss, 2020).

As assessing the quality of the published record or the review process was beyond the scope of this study, the concern that faster publication processes decrease publication quality is yet to be verified. Future research should therefore analyze whether shorter review processes during the COVID-19 pandemic have affected the quality of the publication process and, for instance, have led to an increase in corrections or retractions of published articles.

While acceleration of the review stage might evoke quality issues, this arguably applies less to the production stage of the publication process. Journals' achievements in shortening this stage of the publication process for coronavirus-related content is entirely laudable. However, this might raise questions about why publication delays at this stage are usually higher and whether journals will aim and be able to maintain such standards in a postcrisis era. One potential explanation for the shortened production stage is that publishers or journal editors now prioritize coronavirus-related research articles at the expense of other articles. However, our data on noncoronavirus related articles published during the pandemic seem to contradict this. It seems as though journals are managing to speed up editorial work for coronavirus-related content while maintaining standards for other articles.

Several journals show a substantial lengthening of the production stage. This might be caused by an increase in the number of manuscripts submitted to the respective journals. For journals showing an increase in total turnaround time, this seems to be concentrated in the production stage, after manuscript acceptance. As editors themselves might be practicing scientists, the overload of newly submitted manuscripts might be a cause of this additional delay.

This study suffers from various limitations in its analysis. First, it could only analyze those journal articles that have been published. This particularly implies that it was unable to assess the review process's duration for rejected articles. Neither could it analyze articles that are currently still under review.

Second, the analysis does not include article type as a feature of analysis. Some article types, including letters to the editor, perspectives, or commentaries, might undergo a different kind of peer review—they might, for instance, only be reviewed by the editor, rather than by external reviewers. A potential difference in distribution of pre- and postcrisis articles over the various article types might explain some of the variation in the publication process's duration.

Third, our analyses focus on journals publishing relatively many coronavirus-related articles. Due to a lack of sufficient articles in other, potentially smaller, journals, we were not able to analyze those journals. As larger journals may more easily attract reviewers and have more resources, and hence more capacity to shift resources to execute the production stage of publication, the resulting decrease in publication time might be less strong in smaller journals. At a later stage, when more coronavirus-related papers appear in other journals, future research could verify this potential difference.

Last, it should be noted that some of the journal articles assigned to our control group concern papers related to previous health crises or pandemics, such as the MERS, Ebola or Zika crises. Despite similar incentives to publish those articles quickly, content related to COVID-19 makes its way through the publication process much more quickly. Future research could include a more elaborate comparison not only between pre- and post-COVID-19 eras, but also between publishing in the COVID-19 and other health-related crises.

In these times of crisis, the rapid dissemination of relevant academic knowledge is of paramount importance. Several stakeholders have already warned of a "fake news pandemic" spreading disinformation and conspiracy theories through social media channels in the absence of established scientific knowledge (Khatri, Singh, et al., 2020; UNESCO, 2020). To assist

policymakers and clinical experts, as well as to counter the spread of such disinformation, researchers and academic journals have a responsibility to share available knowledge quickly. The fact that medical journals have managed to considerably speed up their publication process for coronavirus-related content during the current pandemic is therefore laudable. However, some concerns remain about whether faster dissemination might come at the expense of research quality.

## **5. CONCLUSION**

Our analysis indicates that the scholarly publishing enterprise has managed to greatly speed up the dissemination of coronavirus-related research material since the outbreak of the pandemic. In particular, academic journals managed to decrease the duration of their publication process by 49%, or 57 days on average, which is a statistically relevant difference. Some journals even show a decrease in publication time of over 80% compared to the prepandemic era. This acceleration concerns both the stage of review (between submission and acceptance) and the editing stage (between acceptance and publication). The journals in our sample shortened both stages by 47% (45 days) and 61% (14 days) respectively. Hence the majority of the decrease in total publication time is due to speeding up the review process.

We also conclude that the acceleration of the publication process is specific to coronavirus-related articles. Articles not related to COVID-19 published during the pandemic show very similar turnaround times as articles published before the pandemic.

In addition to the fast spread of information through journal articles, the number of papers posted on preprint servers has sharply increased. With only limited data available, such preprints do not seem to be taken up as journal publications any quicker than they were before the COVID-19 pandemic. Nevertheless, articles first appearing as preprints do seem to go through shorter publication processes than articles not appearing as preprints.

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## **COMPETING INTERESTS**

The author has no competing interests.

## **FUNDING INFORMATION**

No funding has been received for this research.

## **DATA AVAILABILITY**

The data analyzed for this research are available via [https://github.com/CWTSLeiden/cwts\\_covid](https://github.com/CWTSLeiden/cwts_covid).

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