

A practical guide to preprints

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A Practical Guide to Preprints

Accelerating Scholarly Communication



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Introduction

In Open Science and academic publishing, the preprint increasingly appears on the radar as an important element in academic communication. By posting preprints, academics can rapidly share their findings and build upon each other's work. Consequently, the number of preprint servers is growing, more and more funders encourage researchers to make their work open access via a [preprint](#), an increasing number of publishers allow authors to post a preprint before submission, and preprints are indexed in search engines like

[Google Scholar](#), [Dimensions](#), [Lens](#) and [OSF preprints](#). Scopus includes preprints in [author profiles](#).

This is a practical and informative guide for researchers on how to post and use preprints, and for the general public (journalists, patients, healthcare workers, etc.) on how to interpret the research published through preprints.

Terms in **orange** are explained in the Glossary.



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What are preprints?

In this guide, we use the following definition of preprints:

Preprints are “[academic] manuscripts that have not been peer reviewed or published in a traditional publishing venue (e.g., journal, conference proceeding, book)” (Malički et al., 2020, p.1901). > [more info](#)

Preprints should not (yet) be regarded as conclusive or guiding specific behaviour. Not all preprints will eventually be published in an academic journal. Academics mainly post preprints to receive early feedback and community review, to speed up dissemination, and to make their work available in open access. > [more info](#)

Preprints are shared publicly, usually on a preprint server – also known as preprint archive. But commercial social networks for academics like ResearchGate and Academia.edu and researchers’ own websites are also used for sharing preprints, even though these alternatives are less suitable (see FAQ nr 6). Most preprint servers give papers a unique and persistent identifier (PID), such as a Digital Object Identifier (DOI), making it easy to include them in reference lists. With a PID, preprints can also be indexed by major search engines and tools providing altmetrics. The DOI assigned to the preprint differs from the DOI that the publisher gives to the accepted and published version of the same article.



Other versions of academic papers include ‘**working paper**’, ‘**manuscript**’, ‘**postprint**’ (also known as ‘**author’s accepted manuscript**’) and ‘**published version**’ (also known as ‘**version of record**’). The differences between them are shown in figure 1 and further explained in the glossary.

Preprints are considered as part of the **scholarly record**. Scholars cannot delete their preprints from a preprint server. However, preprints can be withdrawn. The preprint server will remove the preprint, but basic metadata such as title, authors and the reason for withdrawal will be left visible.

Most established preprint servers have policies regarding withdrawal that are worth checking. > [link 1](#) > [link 2](#) > [link 3](#)

PREPRINTS

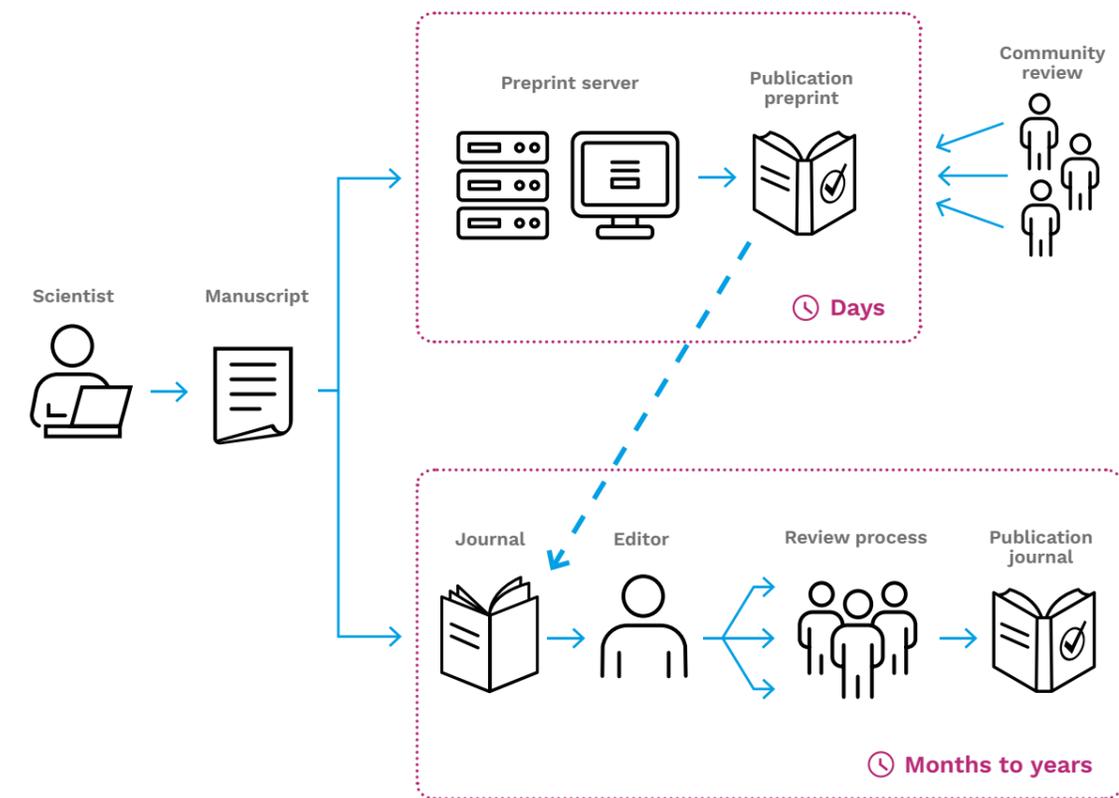


FIGURE 1
THE PLACE FOR PREPRINTS IN THE PUBLICATION WORKFLOW.

Pros and cons of preprints

Sharing a preprint has both advantages and disadvantages. Overall, the benefits outweigh the risks. In the figure below you can find an overview of the pros and cons for researchers only (left part) and for both researchers and the general public (right part of the figure). The icons of the advantages are coloured green, whereas the icons of the disadvantages have the color red.

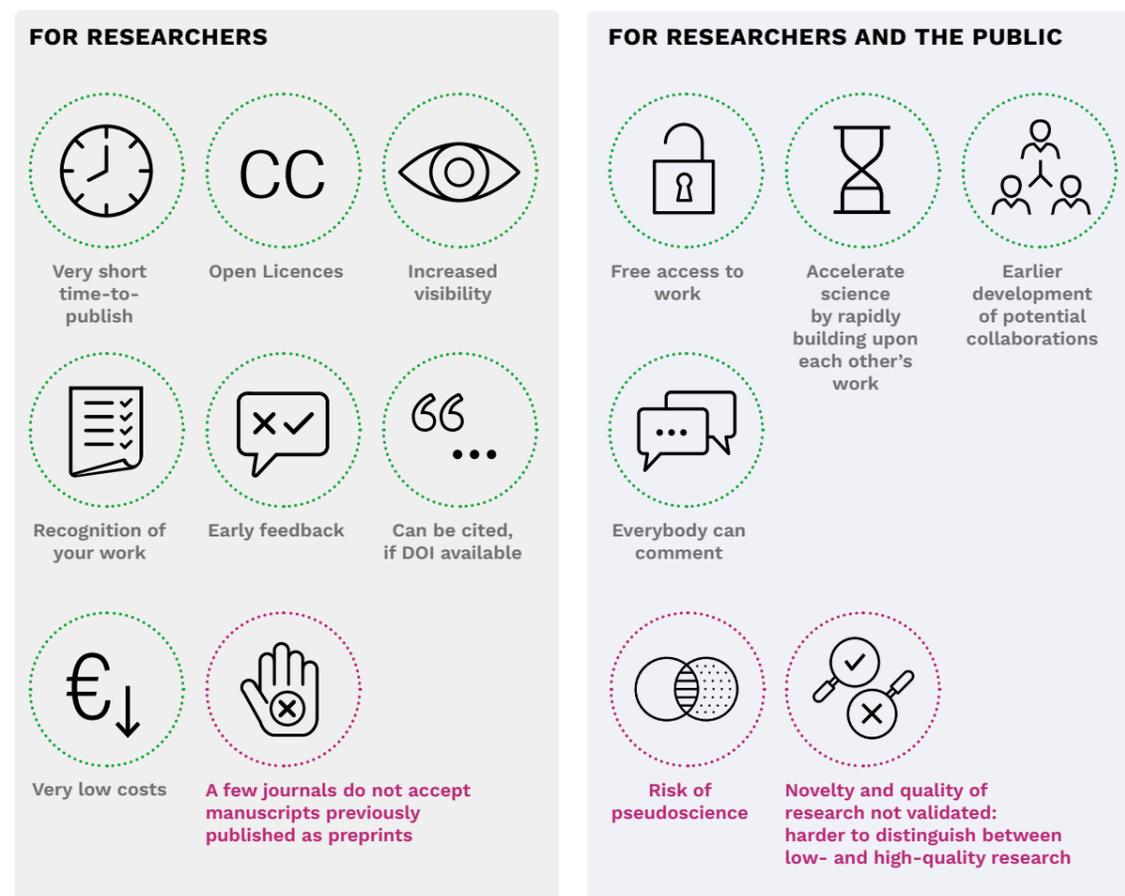


FIGURE 2
THE PROS AND CONS OF PREPRINT FOR RESEARCHERS AND THE GENERAL PUBLIC

What are the disciplinary aspects and recent developments around preprints?

Professionally, systematically and publicly sharing preprints can be traced back to the early 1990s, with arXiv being the best known and largest example. Physics was the first subject area with a growing number of preprints, followed by mathematics, computer science, quantitative biology, quantitative finance, statistics, economics, and electrical engineering and systems science. In 1994, the Social Sciences Research Network (SSRN) was founded. It is generally used as a preprint server for disciplines like economics, law and political sciences. Three years later, economics-focused RePeC followed – not as a preprint server per se, but as an aggregator of preprints and working papers placed throughout repositories.

For a long time, the practice of preprints was mainly seen in the aforementioned academic disciplines and on these main servers. In the mid-2000s, attention for posting preprints also grew in other domains. In 2007, Nature came up with Nature Proceedings for biomedical sciences, chemistry and earth sciences. However, this server ceased activity in 2012. In 2013, bioRxiv was founded for the biomedical disciplines, which is now one of the largest preprint servers.

In 2016, the **Open Science Framework** (OSF), which is part of the **Center for Open Science** project, started to host their own first batch of initially psychology-focused

preprint servers. The OSF currently caters to a wide range of subject areas, though it is most commonly used by Social Sciences & Humanities researchers.

One of the latest additions to the preprint-server families is medRxiv for the medical disciplines, founded in 2019. The recent COVID-19 health crisis has seen a massive increase in preprint deposits, not only in biomedical and health research but also in other disciplines like sociology, psychology and communication studies, as figure 3 on the next page shows.

An increasing number of publishers host their own preprint archives. Major examples are 'First Look' (now part of Elsevier-owned SSRN), Research Square (Springer Nature), Authorea (Wiley) and Preprints.org (MDPI). These archives allow preprints to be linked to a specific journal at an early stage, which makes it something of a middle ground between open access early sharing and more traditional publishing.

Some journals/platforms (F1000 Research, Open Research Europe, Wellcome Open Research) have certain preprint-like characteristics, like early online access and/or parallel community review. However, these should not be confused with preprint servers, as they use certain organized editorial elements that preprint servers lack.

Finally, there are efforts being put forward to bridge the gap between non-reviewed preprint and peer-reviewed journal articles. For example, eLife makes it possible to place journal-mediated peer review reports with the [preprint](#), [Review Commons](#) offers journal-independent peer-review of preprints, and [Peer Community In](#) goes a step further by also recommending preprints based on journal-independent peer-review.

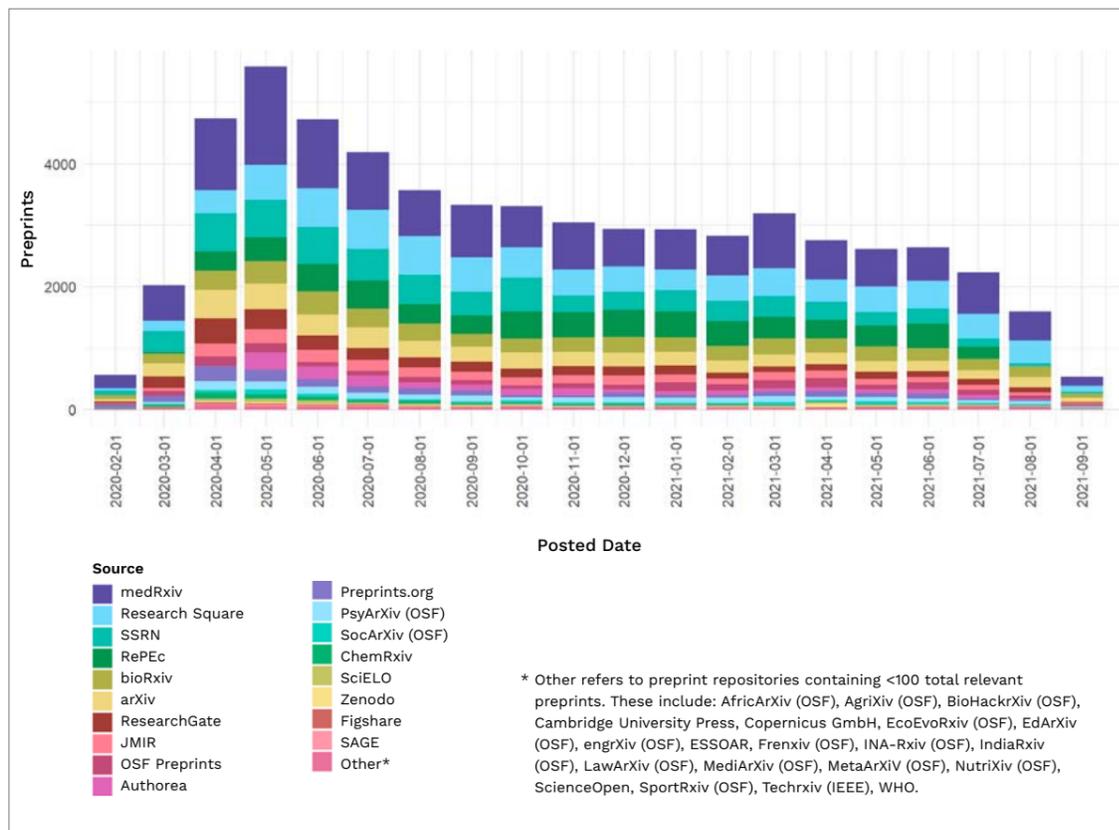


FIGURE 3
 COVID-19 PREPRINTS SUBMITTED PER MONTH FROM 2020-02-01 TO 2021-09-29
 Source: https://github.com/nicholasmfraser/covid19_preprints

Practical guide

This guide aims to provide recommendations for selecting a preprint server and for posting a preprint. It was largely inspired by the [ASAPbio preprint FAQ](#).

Where to find a preprint server

Wikipedia maintains [a list of preprint servers](#). [ASAPbio](#) also keeps an updated list of preprint servers. Figure 4 shows a number of preprint servers and their focus on specific disciplines.

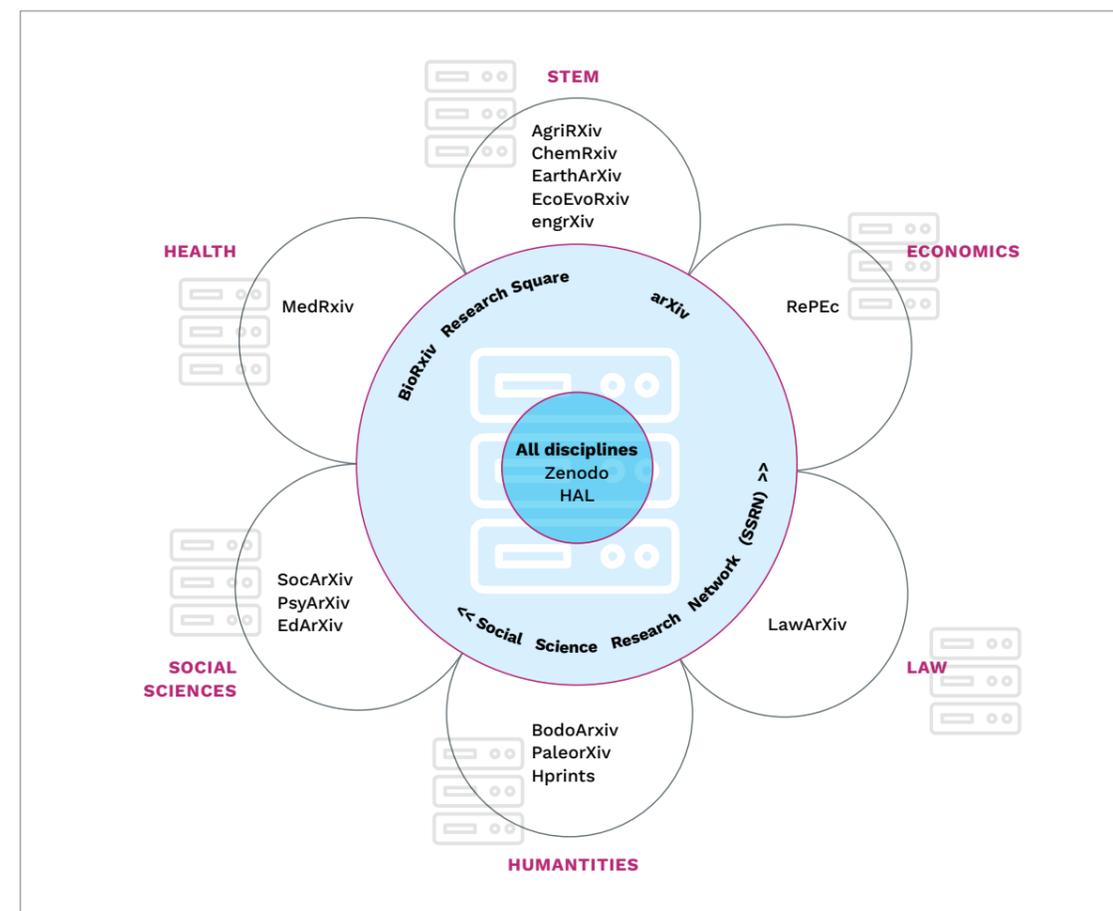


FIGURE 4
 SERVERS PLOTTED PER ACADEMIC DISCIPLINE. NOTE THAT THIS IMAGE ONLY CONTAINS A LIMITED SELECTION OF SERVERS.

What to consider before selecting a preprint server

Significant questions to answer are:

- What is your target audience? Choose a server that targets this audience. Note that when using a generic or multi-disciplinary archive you can still do a lot yourself for reaching your audience once you have shared your document, like sharing the link/DOI in post on mailings lists and on social media.
- What services does the preprint server offer to fit your needs? For example:
 - a **PID** (e.g., **DOI**) for your preprint
 - basic quality checks (e.g., correct metadata, plagiarism, completeness, non-scientific content, health or biosecurity risks)
 - long-term guarantees that the preprint server will stay online
 - **open licence** schemes
 - indexation by search engines, such as Google Scholar
 - services that support reviews and endorsements
 - services that support version control and up-to-date preprints after revisions.

This information can often be found on the website of the preprint server. If not, then contact the preprint server. For further reading, a publication on preprint servers' policies was published in [JAMA](#) with additional information on the [preprint server Research Square](#).

How to post a preprint

What to consider before posting a preprint

Check the journal's policy.

Most journals allow preprints, but check the journal's preprint policy anyway before you submit your paper. [Sherpa Romeo](#) collects this information for [journals](#). If the policy is not clear or not findable, you can always ask the journal's editor.

Get co-author consent.

Make sure your co-authors consent to the submission, including license type and archive choice.

Share data, code and reagents (where applicable).

Does your preprint have related data, code or reagents? Consider sharing these as well, link to their identifiers from the preprint record and cite them in the preprint. Preprint servers often offer the possibility to already reserve a DOI when creating a preprint record. This DOI can then be included in the preprint document and also cited from the data/code/reagents record. Some preprint servers also act as data or code repositories (like Zenodo or the Open Science Framework), but most do not. Do not forget to attach a licence to the data and/or code as well. Please also check the policy of your institution regarding sharing data, code and reagents beforehand and/or contact your [library open access contact](#).

How to prepare a preprint

A preprint should be prepared at least as well as a journal submission, so make sure your article's structure is logical, the numbers add up and the language is checked, preferably by a native speaker.

How to upload a preprint

Upload instructions differ between preprint servers, but the process can be compared to a journal's submission process. It is expected to at least enter the title and abstract of the paper, state the co-author details and upload the preprint file, but sometimes the procedure is much more elaborate. Adding metadata such as keywords will help the findability of your paper.

What licence to choose for a preprint

Although attaching a licence to a preprint is not always mandatory, it is highly recommended so that it is clear how your preprint can be (re)used and to make sure that the copyright remains with the authors. Many preprint servers provide a range of open licences with different levels of restriction to choose from. For an overview of standard licence (Creative Commons) types and tips for choosing a licence, see [this web page](#) or for a more elaborate guide go to [this web page](#).

Keep in mind that the available and/or required licences may differ per preprint server and – if applicable – your research funder. Please note that you can choose a different licence for your preprint than for the Version of Record.



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How to revise a preprint

Most preprint servers support versioning, meaning you can upload a new version of the preprint while the old version is retained and linked to the latest version. A common reason for uploading a new version is feedback received on the previous version. Note that some servers also allow updates with a **postprint** after journal-organised peer review.

How to withdraw a preprint

Withdrawing a preprint is usually only supported when there are substantial legal or ethical concerns with the preprint. If you have reasons for wanting your preprint withdrawn, contact the preprint server.

How to link a preprint to the published journal article

Some preprint servers automatically create links to the published journal article and add them to the metadata of the preprint. If such a link doesn't automatically show on your preprint page, check with the preprint server if you need to do it yourself or if they can do it for you. Several journals add links from the published article back to the preprint. If the latter is not done, add a footnote with the link to the preprint to the manuscript that you'll submit to the journal. That increases the transparency of your work.



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For the public: How to interpret the information in a preprint?

When you search for information and knowledge on the internet, you may wish to read academic articles. Because of a different validation process it may be useful to understand the difference between an academic article and an academic preprint. A preprint resembles

a published article in an academic journal, but it is not the same. What is different is that a preprint generally is a preliminary version of an academic article, shared with the intent of quick communication and as an invite for commentary.

Recognising the differences between a preprint and a published article

Published academic articles have undergone a form of peer review: the editor of a journal asks scholars from the same field to comment on the draft of the paper to determine if the underlying methods and reasoning are sound and valid, and whether the paper is suitable for publication. Journals apply a multitude of models to peer review articles. A small but increasing number of journals use an open model of peer review where the contents of the review and sometimes even the identity of the reviewers are openly available.

Generally speaking, a paper will only be published if these comments are processed well and the paper is adapted by the authors. Thus, official peer review aims to filter out invalid or poor-quality articles – publication in a journal is generally regarded as a quality stamp

(Please note that (formal) peer review can considerably diminish, but not fully prevent, the risk of low-quality research, mistakes, bias or even fraud). But note that neither does peer review guarantee conclusiveness.

For preprints, things are different. A preprint has not yet undergone peer review at a journal. Generally, the floor is still open for other researchers (sometimes from other disciplines) and the public to comment, make suggestions and point out mistakes. Therefore, preprints should not (yet) be regarded as conclusive or guiding specific behaviour. Academics post preprints for several reasons, i.e., to receive early feedback, to speed up dissemination, and to make their work available in open access.

How to recognise a preprint?

- The first page of the preprint usually states that you are dealing with a paper that has not been officially “published”. You may see words like ‘preprint’, ‘concept paper’, ‘working paper’ or ‘author manuscript’ (not to be confused with **author’s accepted manuscript**; which is a peer reviewed but not yet “published” version of a paper).
- A preprint is usually posted on a preprint server (see > [“Where to find a preprint server”](#)). Note that some preprint servers also host the author’s accepted manuscript and that some generic platforms like Zenodo and Figshare can host any versions of papers.
- Some preprint servers allow direct open commenting on the preprint.
- Preprints may, like officially published articles, have a **persistent identifier (PID)**, such as a **DOI**.

What to do if a preprint seems interesting?

Check if the preprint has an official published article. This is usually mentioned in the preprint or in the metadata record of the preprint. If no information is available, search on the internet for a published article by using the title of the preprint. If applicable, use the published article. You may download it online or contact a university library if you can’t access the published article. Dutch university libraries allow you to access scholarly papers on campus, in the building. Always check first if the library you aim to visit can give you access to the particular article. A logistically easier way is to send the author of the article a request for a copy.



Photo by Aaron Burden on Unsplash

If the work has not been officially published yet, you may perform a small quality check by yourself:

- 1 Check the references in the preprint: are most references to other scholars’ published work?
- 2 Check the author(s): use Google Scholar to find out which articles the authors cite themselves and in what context they place their work
- 3 Check earlier published work from the author(s): have they published before? Has that work been cited? Note: a beginning researcher may not have published a lot yet. In that case, co-authors with the same affiliation are probably their supervisors; they should be established researchers in the field.
- 4 Read critically, just as you would read a regular article. Look out for related comments and discussion and check whether the underlying data is available. Use your own (professional) network to ask them to read along with you.

If you would like to use a preprint in a news article, blog, presentation or otherwise you may consider the following:

- 5 When available, check the comments on the article. On the server or on social media. Undoubtedly other researchers and scholars have already looked at the preprint (that’s what it’s for) and have made observations that help you in interpreting.
- 6 Check when the preprint was published. If it was published very recently, you might want to hold off for a moment and let the scientific community do its thing.
- 7 When referring to the preprint, tell your audience that it hasn’t been peer reviewed yet, and explain that it should not (yet) be regarded as conclusive or guide specific behaviour.
- 8 As with any information, also consider contacting someone with knowledge on the subject. Either for an opposing view, or just for context.

FAQ

1

Where to find a preprint server

Preprints are most commonly found on preprint servers but are also shared elsewhere, such as in institutional or national repositories, on commercial social networks for academics such as ResearchGate or on a researcher's website. Wikipedia maintains [a list of preprint servers](#). ASAPbio also keeps an updated list of preprint servers. See also 2.

2

Do search engines discover my preprints?

Most preprint servers are indexed by major search engines like Google Scholar and academic information databases like Dimensions, LENS and EuropePMC. There are websites, like the [Open Science Framework preprint search](#) that aggregate metadata and abstracts for preprints from various sources.

3

Is sharing preprints good for my career?

Sharing preprints is a way to receive feedback and attract attention to your research at an early stage, which positively benefits the quality and impact of your research. Sharing preprints may also lead to new collaborations. Preprints are not yet incorporated into the official reward systems for science in the same way as journal publications are. However, the Dutch NWO and ZonMw accepts preprints as research output when applying for some of their [research programmes](#). With the continuous furthering of the Open Science movement, a broader acceptance of preprints is about to happen. This becomes clear in the UK (where preprints are allowed to be included in the current [Research Excellence Framework \(REF21\)](#)) and the [European Research Council \(ERC\)](#).

4

Will my research be scooped if I share it in a preprint before it's accepted for publication?

Always attach a licence to your preprint so others have to cite it. Are you making yourself more vulnerable by sharing a preprint? Posting a preprint is not that different from presenting your research at a congress or publishing an abstract: they all contain your ideas. Openly sharing a preprint has the advantage that you put a timestamp on your work. This timestamp can establish the priority of discovery.

5

Can I post a preprint on for example Blackboard, my personal website or ResearchGate and Academia.edu?

Yes, you can post a preprint anywhere you like, as long as your co-authors agree. However, compared to a commercial academic social network, like ResearchGate, a preprint server will more likely target your intended audience, and trustworthy, dedicated, preprint servers offer many other advantages (see 'What to consider before selecting a preprint server' on [page 10](#)).

6

Can preprint commentary harm my paper?

In general, commentary and community feedback on your preprints can help you improve your paper. You may also use this feedback to inform the journal editor after submission. Occasionally, commentary may be harmful – for example, if you post a preprint with known flaws, you still need to correct. "Most people are going to read your manuscript only once and you don't get a second chance to make a first impression" (John Inglis, co-founder of [bioRxiv and medRxiv](#)). However, most authors very rarely experience any negative consequences of [preprint posting](#).

Detlef Lohse – [professor Physics of Fluids at the University of Twente; author, referee, editor, and user of arXiv for over 30 years]:

'Papers that are also on arXiv are seen faster and more often, and are cited more often than papers that are not also on arXiv. So your article on arXiv is more accessible to the reader, as quickly as possible. When you submit an article, you want others to be able to read it and send you commentary, so you'll be able to improve the final version. So it's in everyone's interest to use arXiv. As the author, you'll not only receive feedback from referees and the editor, but also from other people in the community who've read your work. It's good for everyone.'

7

How can I cite someone else's preprint in my academic article?

Check with your journal. Most journals do allow citing preprints in a similar way to citing peer reviewed academic papers.

Detlef Lohse – [professor Physics of Fluids at the University of Twente; author, referee, editor, and user of arXiv for over 30 years]:

'About citing a preprint in your article: It doesn't make a difference for Google Scholar. It does make a difference for Web of Science, but when you submit an article with citations to preprints, the publisher of a good journal will check if the published version is already available. If so, then the publisher will make sure that your article cites the version in the journal. So it's never a problem for good journals.'



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Can I upload my preprint to the Institutional Repository of my university?

This differs per university. It is best to contact the local open access support at the university library for guidance.

Glossary

Altmetrics

Non-traditional bibliometrics such as downloads, mentions, views or recommendations > [more info](#).

Author's accepted manuscript

An author's accepted manuscript or postprint is the version that has undergone peer review and has been accepted for publication by an academic journal, conference proceedings or book series. It has not undergone any type-setting or copy-editing. An author's accepted manuscript can often be shared open access with the public through a repository, generally after an embargo period.

Creative Commons licences

A set of rights that a researcher can assign to academic output. These licences are often used for open access publications and data. > [more info](#)

DOI

A Digital Object Identifier is a neverchanging reference (see: Persistent Identifier) to an online object such as an article or a data set. This means in practice that if the current URL changes over time, the DOI will continue to resolve to the right resources at their new locations.

Institutional Repository

An archive for collecting, preserving, and disseminating digital copies of the intellectual output of an institution, particularly a research institution.

Open access

Freely accessible and freely reusable academic works.

Persistent Identifier

A persistent identifier (PI or PID) is a long-lasting digital reference to a document, file, web page, or other object.

Postprint

See author's accepted manuscript.

Preprint

Preprints are "[academic] manuscripts that have not been peer reviewed, type-set or published in a traditional publishing venue.

Published article

The published article or version of record is copy-edited, typeset, formatted and subsequently published (online and/or in print) in an academic journal, conference proceedings or book. The published article is available either by subscription or by open access.

Sherpa Romeo

An online resource that aggregates and analyses publishers' open access policies worldwide, and provides summaries of publisher copyright and open access archiving policies on a journal-by-journal basis. > [more info](#)

Version of Record

See Published article.

Working paper

In general, a working paper is a draft paper which may still be under active development. A working paper may lead to a preprint, postprint and/or published article.

Attribution and Acknowledgements

The answers to the most common questions about preprints and the points in the practical guide were largely inspired by the Open Science Framework Preprint FAQ, the ASAPbio preprint FAQ and the Knowledge Exchange report “Accelerating scholarly communication: The transformative role of preprints”.

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