Submission Guidelines

About the Journal

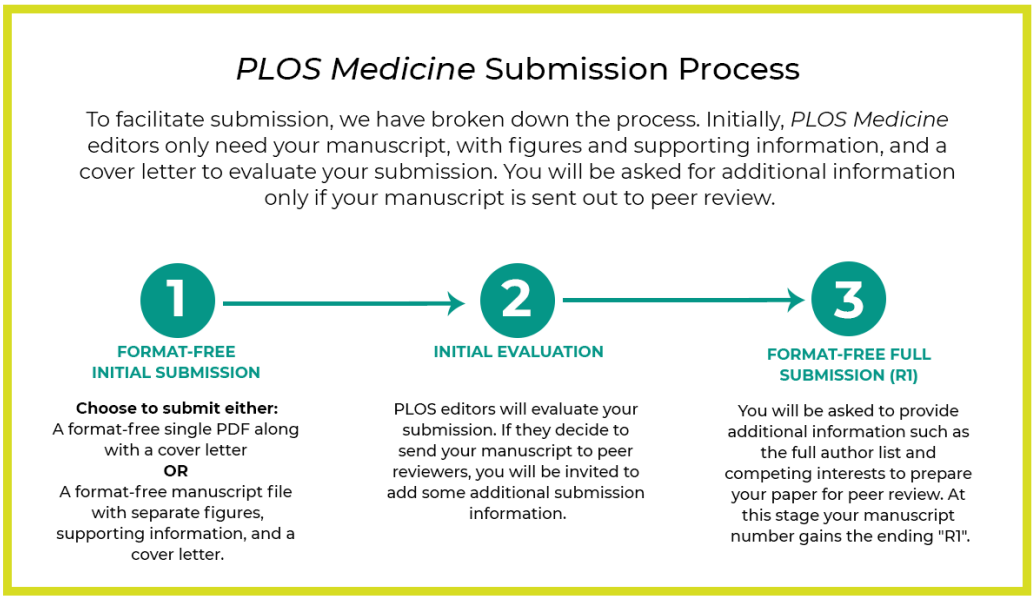
PLOS Medicine publishes original research articles of outstanding medical importance. We will consider manuscripts of any length; we encourage the submission of both substantial full-length bodies of work and shorter manuscripts that report novel findings that might be based on a more limited range of experiments.

The writing style should be concise and accessible, avoiding jargon so that the paper is understandable for readers outside a specialty or those whose first language is not English. Editors will make suggestions for how to achieve this, as well as suggestions for deletions or additions that could be made to the article to strengthen the argument. Our aim is to make the editorial process rigorous and consistent, but not intrusive or overbearing. Authors are encouraged to use their own voice and to decide how best to present their ideas, results, and conclusions.

Related information for authors

- PLOS Writing Center
- Submission system
- Journal scope and publication criteria
- Getting started guide
- Guidelines for magazine submissions
- Guidelines for revisions
- Publication fees

About the Submission Process



Format-free initial submission

PLOS Medicine uses the initial submission process, allowing authors to quickly submit to the journal and obtain rapid feedback from the editors. If the editors decide that the work is suitable for peer review, authors will be asked to provide a full submission with additional information.

Qualifying article types	This process applies to all article types submitted to *PLOS Medicine*.

Submission elements	› Corresponding author information › Manuscript (with title page containing full author list) › Cover letter › Figures › Supporting information
Submission format	› A single PDF file containing manuscript, figues and supporting information files, with a separate cover letter (recommended for ease of initial submission) **OR** › If preferred, upload figure files alongside a PDF or Word manuscript file, with a separate cover letter

Creating an initial submission is the most efficient way to obtain feedback from the journal. Authors who email with an inquiry will be asked to submit the manuscript as an initial submission.

Format-free full submission

If you receive an initial decision from the journal committing to peer review, you will be asked to complete a full submission with additional information including:

- Full author list and author details
- Details of the availability of data generated in the study
- Details of any ethical approvals
- Details of clinical trials registration, if applicable

Style and Format

The Style and Format criteria below are required only if the manuscript is pursued for publication with a positive decision after peer review. Authors invited to submit a revision will be prompted to format their manuscript in line with these requirements. We do not require specific formatting of manuscripts for Full Submission.

Style and Format

File format	Submit the manuscript file in DOC, DOCX, RTF, or PDF format. Your file should not be locked or protected. If you have written your manuscript in LaTeX, please submit as a PDF. Read the LaTeX guidelines.
Length	Manuscripts can be any length. There are no restrictions on word count, number of figures, or amount of supporting information. We encourage you to present and discuss your findings concisely.
Font	Use a standard font size and any standard font, except for the font named “Symbol”. To add symbols to the manuscript, use the Insert → Symbol function in your word processor or paste in the appropriate Unicode character.
Headings	Limit manuscript sections and sub-sections to 3 heading levels. Make sure heading levels are clearly indicated in the manuscript text.
Layout and spacing	Manuscript text should be double-spaced. Do not format text in multiple columns.
Page and line numbers	Include page numbers and line numbers in the manuscript file. Use continuous line numbers (do not restart the numbering on each page).
Footnotes	Footnotes are not permitted. If your manuscript contains footnotes, move the information into the main text or the reference list, depending on the content.
Language	Manuscripts must be submitted in English. You may submit translations of the manuscript or abstract as supporting information. Read the supporting information guidelines.
Abbreviations	Define abbreviations upon first appearance in the text. Do not use non-standard abbreviations unless they appear at least three times in the text. List all non-standard abbreviations (with definitions) in alphabetical order in a separate section at the beginning of the manuscript. Keep abbreviations to a minimum.
Reference style	PLOS uses “Vancouver” style, as outlined in the ICMJE sample references. See reference formatting examples and additional instructions below.
Equations	We recommend using MathType for display and inline equations, as it will provide the most reliable outcome. If this is not possible, Equation Editor or Microsoft's Insert→Equation function is acceptable. Please do not embed equations as images. Avoid using MathType, Equation Editor, or the Insert→Equation function to insert single variables (e.g., “$a^2 + b^2 = c^{2n}$”), Greek or other symbols (e.g., β, Δ, or ′ [prime]), or mathematical operators (e.g., x, ≥, or ±) in running text. Wherever possible, insert single symbols as normal text with the correct Unicode (hex) values. Do not use MathType, Equation Editor, or the Insert→Equation function for only a portion of an equation. Rather, ensure that the entire equation is included. Equations should not contain a mix of different equation tools. Avoid “hybrid” inline or display equations, in which part is text and part is MathType, or part is MathType and part is Equation Editor.
Nomenclature	Use correct and established nomenclature wherever possible. *Units of measurement*: Use SI units. If you do not use these exclusively, provide the SI value in parentheses after each value. Read more about SI units.

Drugs	Provide the Recommended International Non-Proprietary Name (rINN).
Species names	Write in italics (e.g., *Homo sapiens*). Write out in full the genus and species, both in the title of the manuscript and at the first mention of an organism in a paper. After first mention, the first letter of the genus name followed by the full species name may be used (e.g., *H. sapiens*).
Genes, mutations, genotypes, and alleles	Write in italics. Use the recommended name by consulting the appropriate genetic nomenclature database (e.g., HGNC for human genes; we strongly recommend using this tool to check against previously approved names). It is sometimes advisable to indicate the synonyms for the gene the first time it appears in the text. Gene prefixes such as those used for oncogenes or cellular localization should be shown in roman typeface (e.g., v-fes, c-MYC).
Allergens	The systematic allergen nomenclature of the World Health Organization/International Union of Immunological Societies (WHO/IUIS) Allergen Nomenclature Sub-committee should be used for manuscripts that include the description or use of allergenic proteins. For manuscripts describing new allergens, the systematic name of the allergen should be approved by the WHO/IUIS Allergen Nomenclature Sub-committee prior to manuscript publication. Examples of the systematic allergen nomenclature can be found at the WHO/IUIS Allergen Nomenclature site.

Manuscript Organization

Most manuscripts should be organized as follows. Instructions for each element appear below.

- Title
- Authors
- Affiliations
- Abstract
- Introduction
- Methods (or Methods and Materials)
- Results
- Discussion
- Acknowledgments
- References
- Supporting information captions

Other elements

- Upon revision, figure files should be uploaded separately from the manuscript, and each figure caption should be inserted in read order after the first paragraph where the figure is cited. Read more information about our figure requirements during each stage of editorial review.
- Tables are inserted immediately after the first paragraph in which they are cited.
- Supporting information files are uploaded separately.

Refer to our downloadable sample files to ensure that your submission meets our formatting requirements:

- Download sample title, author list, and affiliations page (PDF)
- Download sample manuscript body (PDF)

Parts of a Submission

Title

Include a full title and a short title for the manuscript.

Title	Length	Guidelines	Examples

Full title	200 characters	Specific, descriptive, concise, and comprehensible to readers outside the field	Impact of cigarette smoke exposure on innate immunity: A *Caenorhabditis elegans* model Solar drinking water disinfection (SODIS) to reduce childhood diarrhoea in rural Bolivia: A cluster-randomized, controlled trial
Short title	70 characters	State the topic of the study	Cigarette smoke exposure and innate immunity SODIS and childhood diarrhoea

Titles should be written in sentence case (only the first word of the text, proper nouns, and genus names are capitalized). Avoid specialist abbreviations if possible. For clinical trials, systematic reviews, or meta-analyses, the subtitle should include the study design.

Author list

Authorship requirements

All authors must meet the criteria for authorship as outlined in the authorship policy. Those who contributed to the work but do not meet the criteria for authorship can be mentioned in the Acknowledgments. Read more about Acknowledgments.

The corresponding author must provide an ORCID iD at the time of submission by entering it in the user profile in the submission system. Read more about ORCID.

Author names and affiliations

During initial submission, enter author names on the title page of the manuscript. If your manuscript is selected for peer review, you will also add author details to the submission system.

On the title page, write author names in the following order:

- First name (or initials, if used)
- Middle name (or initials, if used)
- Last name (surname, family name)

Each author on the list must have an affiliation. The affiliation includes department, university, or organizational affiliation and its location, including city, state/province (if applicable), and country. Authors have the option to include a current address in addition to the address of their affiliation at the time of the study. The current address should be listed in the byline and clearly labeled “current address.” At a minimum, the address must include the author’s current institution, city, and country.

If an author has multiple affiliations, enter the full list of affiliations on the title page. In the submission system, enter only the preferred or primary affiliation. Author affiliations will be listed in the typeset PDF article in the same order that the authors are listed in the submission.

Author names will be published exactly as they appear in the manuscript file. Please double-check the information carefully to make sure it is correct.

Corresponding author

The submitting author is automatically designated as the corresponding author in the submission system. The corresponding author is the primary contact for the journal office and the only author able to view or change the manuscript while it is under editorial consideration.

The corresponding author role may be transferred to another coauthor. However, note that transferring the corresponding author role also transfers access to the manuscript. (To designate a new corresponding author while the manuscript is still under consideration, watch the video tutorial below.)

Only one corresponding author can be designated in the submission system, but this does not restrict the number of corresponding authors that may be listed on the article in the event of publication. Whoever is designated as a corresponding author on the title page of the manuscript file will be listed as such upon publication. Include an email address for each corresponding author listed on the title page of the manuscript.

Consortia and group authorship

If a manuscript is submitted on behalf of a consortium or group, include its name in the manuscript byline. Do not add it to the author list in the submission system. You may include the full list of members in the Acknowledgments or in a supporting information file.

PubMed only indexes individual consortium or group author members listed in the article byline. If included, these individuals must qualify for authorship according to our criteria.

Read the group authorship policy.

Author contributions

You will enter all author contributions in the submission system if your manuscript is selected for peer review. Provide at minimum one contribution for each author, and use the CRediT taxonomy to describe each contribution. Read the policy and the full list of roles.

To qualify for authorship, all contributors must meet at least one of the seven core contributions (conceptualization, methodology, software, validation, formal analysis, investigation, data curation), as well as at least one of the writing contributions (original draft preparation, review and editing). Authors may also satisfy the other remaining contributions; however, these alone will not qualify them for authorship.

Contributions will be published with the final article, and they should accurately reflect contributions to the work. The submitting author is responsible for completing this information at full submission, and we expect that all authors will have reviewed, discussed, and agreed to their individual contributions ahead of this time.

All authors will be contacted via email upon Full Submission to ensure that they are aware of and approve the submission of the manuscript, its content, authorship, and order of authorship. Articles will not be published unless all authors have provided their assent to publication.

Cover letter

Upload a cover letter as a separate file in the online system.

The cover letter should address the following questions:

- Why is this manuscript suitable for publication in *PLOS Medicine*?
- Why will your study inspire researchers or clinicians, and how will it improve patient care or public health, or drive the understanding of disease forward?

Title page

The title, authors, and affiliations should all be included on a title page as the first page of the manuscript file.

Download our sample title, author list, and affiliations page (PDF)

Abstract

The Abstract comes after the title page in the manuscript file. The abstract text is also entered in a separate field in the submission system.

The research article Abstract is divided into the following three sections: Background, Methods and Findings, and Conclusions. It should contain all the following elements (items in square brackets are needed only for some study types).

PLOS Medicine prefers abstract submissions not exceed 300 words, with a maximum of 500 words allowed.

Background

- This section should clearly describe the rationale for the study. It should end with a statement of the specific study hypothesis and/or study objectives.

Methods and Findings

- Describe the study participants or what was studied (e.g., patient population, cell lines; be as specific as possible, including numbers of individuals studied). Describe the study design, intervention if applicable, main methods used, primary outcome measure(s), and length of follow up if applicable.
- [If appropriate, include how many participants were assessed out of those enrolled. For survey research, include the response rate.]
- [If critical to the understanding of the paper, describe how results were analyzed, i.e., which specific statistical tests were used.]
- Describe the main outcomes and quantify the results using a measure of precision (e.g., 95% confidence interval). Describe any adverse events.
- Describe the main limitations of the study.

Conclusions

- Provide a general interpretation of the results with any important recommendations for future research.
- [For a clinical trial, provide any trial identification number(s) and name(s) (e.g., trial registration number, protocol number or acronym).]

Introduction

The introduction should put the focus of the manuscript into a broader context. As you compose the Introduction, think of readers who are not experts in this field. Include a brief review of the key literature. If there are relevant controversies or disagreements in the field, they should be mentioned so that a non-expert reader can delve into these issues further. The Introduction should conclude with a brief statement of the overall aim of the experiments and a comment about whether that aim was achieved.

Methods

The Methods should provide enough detail for reproduction of the findings. Protocols for new methods should be included, but well-established methodological procedures may simply be referenced. A full description of the methods should be included in the manuscript itself rather than in a supplemental file.

Methods should also include a section with descriptions of any statistical methods used. The description should conform to the criteria outlined by the Uniform Requirements, as follows:

> *Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to judge its appropriateness for the study and to verify the reported results. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Avoid relying solely on statistical hypothesis testing, such as P values, which fail to convey important information about effect size and precision of estimates. References for the design of the study and statistical methods should be to standard works when possible (with pages stated). Define statistical terms, abbreviations, and most symbols. Specify the statistical software package(s) and versions used. Distinguish prespecified from exploratory analyses, including subgroup analyses.*

Submit detailed protocols for newer or less established methods. Well-established protocols may simply be referenced. Protocol documents for clinical trials, observational studies, and other **non-laboratory** investigations may be uploaded as supporting information.

We recommend and encourage you to deposit **laboratory protocols** in protocols.io, where protocols can be assigned their own persistent digital object identifiers (DOIs).

To include a link to a protocol in your article:

1. Describe your step-by-step protocol on protocols.io
2. Select **Get DOI** to issue your protocol a persistent digital object identifier (DOI)
3. Include the DOI link in the Methods section of your manuscript using the following format provided by protocols.io: http://dx.doi.org/10.17504/protocols.io.[PROTOCOL DOI]

At this stage, your protocol is only visible to those with the link. This allows editors and reviewers to consult your protocol when evaluating the manuscript. You can make your protocols public at any time by selecting **Publish** on the protocols.io site. Any referenced protocol(s) will automatically be made public when your article is published.

PLOS ONE offers an option for publishing peer-reviewed Lab Protocol articles, which describe protocols hosted on protocols.io articles. Read more information on Lab Protocol articles.

Results

The Results section should include all primary and secondary outcome measures analyzed. The section may be divided into subsections, each with a concise subheading. Tables and figures central to the study should be included in the main paper. The Results section should be written in past tense.

PLOS journals require authors to make all data underlying the findings described in their manuscript fully available without restriction, with rare exception.

Large data sets, including raw data, may be deposited in an appropriate public repository. See our list of recommended repositories.

For smaller data sets and certain data types, authors may provide their data within Supporting Information files accompanying the manuscript. Authors should take care to maximize the accessibility and reusability of the data by selecting a file format from which data can be efficiently extracted (for example, spreadsheets or flat files should be provided rather than PDFs when providing tabulated data).

For more information on how best to provide data, read our policy on data availability. PLOS does not accept references to "data not shown."

As outlined in the Uniform Requirements:

> *Give numeric results not only as derivatives (for example, percentages) but also as the absolute numbers from which the derivatives were calculated, and specify the statistical significance attached to them, if any. Restrict tables and figures to those needed to explain the argument of the paper and to assess supporting data. Use graphs as an alternative to tables with many entries; do not duplicate data in graphs and tables. Avoid nontechnical uses of technical terms in statistics, such as "random" (which implies a randomizing device), "normal," "significant," "correlations," and "sample."*

Discussion

The Discussion should be concise and tightly argued. It should start with a brief summary of the main findings. It should include paragraphs on the generalizability, clinical relevance, strengths, and limitations of your study.

You may wish to discuss the following points also:

- How do the conclusions affect the existing knowledge in the field?
- How can future research build on these observations and what are the key experiments that must be done?

Acknowledgments

Those who contributed to the work but do not meet our authorship criteria should be listed in the Acknowledgments with a description of the contribution.

Authors are responsible for ensuring that anyone named in the Acknowledgments agrees to be named.

> PLOS journals publicly acknowledge the indispensable efforts of our editors and reviewers on an annual basis. To ensure equitable recognition and avoid any appearance of partiality, do not include editors or peer reviewers—named or unnamed—in the Acknowledgments.
>
> Do not include funding sources in the Acknowledgments or anywhere else in the manuscript file. Funding information should only be entered in the financial disclosure section of the submission system.

References

Any and all available works can be cited in the reference list. Acceptable sources include:

- Published or accepted manuscripts
- Manuscripts on preprint servers, providing the manuscript has a citable DOI or arXiv URL.

Do not cite the following sources in the reference list:

- Unavailable and unpublished work, including manuscripts that have been submitted but not yet accepted (e.g., "unpublished work," "data not shown"). Instead, include those data as supplementary material or deposit the data in a publicly available database.
- Personal communications (these should be supported by a letter from the relevant authors but not included in the reference list)
- Submitted research should not rely upon retracted research. You should avoid citing retracted articles unless you need to discuss retracted work to provide historical context for your submitted research. If it is necessary to discuss retracted work, state the article's retracted status in your article's text and reference list.

Ensure that your reference list includes full and current bibliography details for every cited work at the time of your article's submission (and publication, if accepted). If cited work is corrected, retracted, or marked with an expression of concern before your article is published, and if you feel it is appropriate to cite the

work even in light of the post-publication notice, include in your manuscript citations and full references for both the affected article and the post-publication notice. Email the journal office if you have questions.

References are listed at the end of the manuscript and numbered in the order that they appear in the text. In the text, cite the reference number in square brackets (e.g., “We used the techniques developed by our colleagues [19] to analyze the data”). PLOS uses the numbered citation (citation-sequence) method and first six authors, et al.

Do not include citations in abstracts.

Make sure the parts of the manuscript are in the correct order *before* ordering the citations.

Formatting references

Because all references will be linked electronically as much as possible to the papers they cite, proper formatting of references is crucial.

PLOS uses the reference style outlined by the International Committee of Medical Journal Editors (ICMJE), also referred to as the “Vancouver” style. Example formats are listed below. Additional examples are in the ICMJE sample references.

A reference management tool, EndNote, offers a current style file that can assist you with the formatting of your references. If you have problems with any reference management program, please contact the source company's technical support.

Journal name abbreviations should be those found in the National Center for Biotechnology Information (NCBI) databases.

Source	Format
Published articles	Hou WR, Hou YL, Wu GF, Song Y, Su XL, Sun B, et al. cDNA, genomic sequence cloning and overexpression of ribosomal protein gene L9 (rpL9) of the giant panda (Ailuropoda melanoleuca). Genet Mol Res. 2011;10: 1576-1588. Devaraju P, Gulati R, Antony PT, Mithun CB, Negi VS. Susceptibility to SLE in South Indian Tamils may be influenced by genetic selection pressure on TLR2 and TLR9 genes. Mol Immunol. 2014 Nov 22. pii: S0161-5890(14)00313-7. doi: 10.1016/j.molimm.2014.11.005. Note: A DOI number for the full-text article is acceptable as an alternative to or in addition to traditional volume and page numbers. When providing a DOI, adhere to the format in the example above with both the label and full DOI included at the end of the reference (doi: 10.1016/j.molimm.2014.11.005). Do not provide a shortened DOI or the URL.
Accepted, unpublished articles	Same as published articles, but substitute “Forthcoming” for page numbers or DOI.
Online articles	Huynen MMTE, Martens P, Hilderlink HBM. The health impacts of globalisation: a conceptual framework. Global Health. 2005;1: 14. Available from: http://www.globalizationandhealth.com/content/1/1/14
Books	Bates B. Bargaining for life: A social history of tuberculosis. 1st ed. Philadelphia: University of Pennsylvania Press; 1992.
Book chapters	Hansen B. New York City epidemics and history for the public. In: Harden VA, Risse GB, editors. AIDS and the historian. Bethesda: National Institutes of Health; 1991. pp. 21-28.
Deposited articles (preprints, e-prints, or arXiv)	Krick T, Shub DA, Verstraete N, Ferreiro DU, Alonso LG, Shub M, et al. Amino acid metabolism conflicts with protein diversity. arXiv:1403.3301v1 [Preprint]. 2014 [cited 2014 March 17]. Available from: https://128.84.21.199/abs/1403.3301v1 Kording KP, Mensh B. Ten simple rules for structuring papers. BioRxiv [Preprint]. 2016 bioRxiv 088278 [posted 2016 Nov 28; revised 2016 Dec 14; revised 2016 Dec 15; cited 2017 Feb 9]: [12 p.]. Available from: https://www.biorxiv.org/content/10.1101/088278v5 doi: 10.1101/088278

Source	Format
Published media (print or online newspapers and magazine articles)	Fountain H. For Already Vulnerable Penguins, Study Finds Climate Change Is Another Danger. The New York Times. 2014 Jan 29 [Cited 2014 March 17]. Available from: http://www.nytimes.com/2014/01/30/science/earth/climate-change-taking-toll-on-penguins-study-finds.html
New media (blogs, web sites, or other written works)	Allen L. Announcing PLOS Blogs. 2010 Sep 1 [cited 17 March 2014]. In: PLOS Blogs [Internet]. San Francisco: PLOS 2006 - . [about 2 screens]. Available from: http://blogs.plos.org/plos/2010/09/announcing-plos-blogs/.
Masters' theses or doctoral dissertations	Wells A. Exploring the development of the independent, electronic, scholarly journal. M.Sc. Thesis, The University of Sheffield. 1999. Available from: http://cumincad.scix.net/cgi-bin/works/Show?2e09
Databases and repositories (Figshare, arXiv)	Roberts SB. QPX Genome Browser Feature Tracks; 2013 [cited 2013 Oct 5]. Database: figshare [Internet]. Available from: http://figshare.com/articles/QPX_Genome_Browser_Feature_Tracks/701214
Multimedia (videos, movies, or TV shows)	Hitchcock A, producer and director. Rear Window [Film]; 1954. Los Angeles: MGM.

Supporting information

Authors can submit essential supporting files and multimedia files along with their manuscripts. All supporting information will be subject to peer review. All file types can be submitted, but files must be smaller than 20 MB in size.

Authors may use almost any description as the item name for a supporting information file as long as it contains an “S” and number. For example, “S1 Appendix” and “S2 Appendix,” “S1 Table” and “S2 Table,” and so forth.

Supporting information files are published exactly as provided, and are not copyedited.

Supporting information captions

List supporting information captions at the end of the manuscript file. Do not submit captions in a separate file.

The file number and name are required in a caption, and we highly recommend including a one-line title as well. You may also include a legend in your caption, but it is not required.

Example caption

S1 Text. Title is strongly recommended. Legend is optional.

In-text citations

We recommend that you cite supporting information in the manuscript text, but this is not a requirement. If you cite supporting information in the text, citations do not need to be in numerical order.

Read the supporting information guidelines for more details about submitting supporting information and multimedia files.

Figures and Tables

Figure files

If you are submitting an **Initial** or **Full Submission** and would prefer to embed each figure in the manuscript, do so in read order, immediately following the paragraph where the figure is first mentioned and above the related figure caption.

Upon revision, prepare and submit each figure as an individual file, removing all embedded figures.

Figure citations

Cite figures in ascending numeric order upon first appearance in the manuscript file.

For detailed instructions, read the guidelines for figures.

Figure captions

Insert figure captions in the manuscript text, immediately following the paragraph where the figure is first cited (read order). Don't include captions as part of the figure files themselves or submit them in a separate document.

At a minimum, include the following in your figure captions:

- A figure label with Arabic numerals, and "Figure" abbreviated to "Fig" (e.g. Fig 1, Fig 2, Fig 3, etc). Match the label of your figure with the name of the file uploaded at submission (e.g. a figure citation of "Fig 1" must refer to a figure file named "Fig1.tif").
- A concise, descriptive title

The caption may also include a legend as needed.

Read more about figure captions.

Avoiding image manipulation

As part of our efforts to improve published figure quality, we routinely and thoroughly check all main and supporting figures for all papers editorially accepted for publication in *PLOS Medicine*. In doing so, we not only ensure that all figure files meet our requirements for publication and are available to publish under our CC BY license, but also that we remain vigilant to image manipulation of photographic images.

Image files should not be manipulated or adjusted in any way that could lead to misinterpretation of the information present in the original image. For full details on best practices regarding your figures, read our figure guidelines.

If evidence is found of inappropriate manipulation, we reserve the right to ask for original data and, if that is not satisfactory, we may decide not to accept the manuscript, and may also contact the authors' institutions to ask them to assist with investigation.

In checking for manipulation, we may request higher resolution versions of your images, or the original images, so that we can efficiently and accurately check all figures.

If you ever need to email files to the journal office, our system has a 10 MB attachment limit, meaning that we will not receive any emails larger than this size. If your files are larger than 10 MB, please either send them one email at a time, or look into reducing the size of the files. If you are having problems sending us large files, please contact the journal office for details of how we can help you transfer your files.

Tables

Cite tables in ascending numeric order upon first appearance in the manuscript file.

Place each table in your manuscript file directly after the paragraph in which it is first cited (read order). Do not submit your tables in separate files.

Tables require a label (e.g., "Table 1") and brief descriptive title to be placed above the table. Place legends, footnotes, and other text below the table.

Read the guidelines for tables.

Data reporting

All data and related metadata underlying the findings reported in a submitted manuscript should be deposited in an appropriate public repository, unless already provided as part of the submitted article.

Read our policy on data availability.

Repositories may be either subject-specific (where these exist) and accept specific types of structured data, or generalist repositories that accept multiple data types. We recommend that authors select repositories appropriate to their field. Repositories may be subject-specific (e.g., GenBank for sequences

and PDB for structures), general, or institutional, as long as DOIs or accession numbers are provided and the data are at least as open as CC BY. Authors are encouraged to select repositories that meet accepted criteria as trustworthy digital repositories, such as criteria of the Centre for Research Libraries or Data Seal of Approval. Large, international databases are more likely to persist than small, local ones.

See our list of recommended repositories.

To support data sharing and author compliance of the PLOS data policy, we have integrated our submission process with a select set of data repositories. The list is neither representative nor exhaustive of the suitable repositories available to authors. Current repository integration partners include Dryad and FlowRepository. Please contact data@plos.org to make recommendations for further partnerships.

Instructions for PLOS submissions with data deposited in an integration partner repository:

- Deposit data in the integrated repository of choice.
- Once deposition is final and complete, the repository will provide you with a dataset DOI (provisional) and private URL for reviewers to gain access to the data.
- Enter the given data DOI into the full Data Availability Statement, which is requested in the Additional Information section of the PLOS Full Submission form. Then provide the URL passcode in the Attach Files section.

If you have any questions, please email us.

Accession numbers

All appropriate data sets, images, and information should be deposited in an appropriate public repository. See our list of recommended repositories.

Accession numbers (and version numbers, if appropriate) should be provided in the Data Availability Statement. Accession numbers or a citation to the DOI should also be provided when the data set is mentioned within the manuscript.

In some cases authors may not be able to obtain accession numbers of DOIs until the manuscript is accepted; in these cases, the authors must provide these numbers at acceptance. In all other cases, these numbers must be provided at full submission.

Identifiers

As much as possible, please provide accession numbers or identifiers for all entities such as genes, proteins, mutants, diseases, etc., for which there is an entry in a public database, for example:

- Ensembl
- Entrez Gene
- FlyBase
- InterPro
- Mouse Genome Database (MGD)
- Online Mendelian Inheritance in Man (OMIM)
- PubChem

Identifiers should be provided in parentheses after the entity on first use.

Additional Information Requested at Submission

Financial Disclosure Statement

This information should describe sources of funding that have supported the work. If your manuscript is published, your statement will appear in the Funding section of the article.

Include your statement in the Financial Disclosure section of the initial submission form.

The statement should include:

- Specific grant numbers
- Initials of authors who received each award
- URLs to sponsors' websites

Also state whether any sponsors or funders (other than the named authors) played any role in:

- Study design

- Data collection and analysis
- Decision to publish
- Preparation of the manuscript

If they had no role in the research, include this sentence: “The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.”

If the study was unfunded, include this sentence as the Financial Disclosure statement: “The author(s) received no specific funding for this work."

Read our policy on disclosure of funding sources.

Competing interests

This section should list specific competing interests associated with any of the authors. If authors declare that no competing interests exist, the article will include a statement to this effect.

All authors will be contacted by email at submission of the full paper to declare whether they have any financial, personal or professional interests that could be construed to have influenced their paper. Any relevant competing interests of authors must be available to editors and reviewers during the review process and will be stated in published articles.

Read our policy on competing interests.

Related manuscripts

When submitting a manuscript, all authors are asked to indicate that they do not have a related or duplicate manuscript under consideration (or accepted) for publication elsewhere. If related work has been or will be submitted elsewhere or is in press elsewhere, then a copy must be uploaded with the article submitted to PLOS. Reviewers will be asked to comment on the overlap between related submissions.

Read our policies on related manuscripts.

Preprints

PLOS encourages authors to post preprints to accelerate the dissemination of research. Posting a manuscript on a preprint server does not impact consideration of the manuscript at any PLOS journal.

Authors posting on bioRxiv or medRxiv can choose to concurrently submit their manuscripts to relevant PLOS journals through the direct transfer service.

Authors submitting manuscripts in the health sciences to *PLOS Medicine* may choose to have PLOS forward their submission to medRxiv for consideration for posting as a preprint.

Read more about preprints.

Learn how to post a preprint to medRxiv at *PLOS Medicine.*

Guidelines for Specific Study Types

Study design, reporting, and analyses are assessed against all relevant research and methodological technique standards held by the community. Guidelines for specific study types are outlined below.

Authors must check the EQUATOR Network site for any reporting guidelines that apply to the particular study design and ensure they include any required supporting information recommended by the relevant guidelines.

Documentation for specific studies should be uploaded as supporting information during manuscript submission. When referencing parts of the manuscript in these documents, please quote section or paragraph numbers rather than page numbers, as page numbers in your submission may not match those of the published manuscript.

Human and animal research

All research involving humans and animals must have been approved by the authors' institutional review board or equivalent committee(s), and that board must be named by the authors in the manuscript.

For research involving human participants, informed consent must have been obtained or the reason for lack of consent explained, and all clinical investigations must have been conducted according to the principles expressed in the Declaration of Helsinki. The Methods section of the paper must state whether informed consent was written or oral. If informed consent was oral, it must be stated in the paper: (a) why written consent could not be obtained, (b) that the IRB approved the use of oral consent, and (c) how oral consent was documented.

Authors may be required to submit, on request, a statement from the research ethics committee or institutional review board indicating approval of the research. We also encourage authors to submit a sample of a patient consent form, and may require submission in particular instances.

For studies involving humans categorized by race/ethnicity, age, disease/disabilities, religion, sex/gender, sexual orientation, or other socially constructed groupings, authors should, as much as possible,

- make explicit their methods of categorizing human populations;
- define categories in as much detail as the study protocol allows;
- justify their choices of definitions and categories, including for example whether any rules of human categorization were required by their funding agency;
- explain whether (and if so, how) they controlled for confounding variables such as socioeconomic status, nutrition, environmental exposures, etc.

In addition, outmoded terms and potentially stigmatizing labels should be changed to more current, acceptable terminology. For example, “white” should be used rather than “Caucasian” and “patients with cancer” should be used rather than “cancer patients” or “cancer victims”.

PLOS Medicine publishes few animal studies but will consider animal studies of two kinds:

1. Translational studies that establish a novel explanatory mechanism for a significant clinical problem, to an extent that will directly inform specific clinical approaches. Such papers must include or refer to human data that is sufficiently compelling to establish clinical relevance of the animal model.
2. Models relevant to the treatment or prevention of major health problems, in which the interventions cannot be tested in humans for ethical reasons, but will provide compelling justification for specific changes in the design of subsequent clinical trials.

All animal work must have been conducted according to relevant national and international guidelines. In addition, *PLOS Medicine* requires that animal research follows the ARRIVE guidelines. In accordance with the recommendations of the Weatherall report, *The use of non-human primates in research*, we specifically require authors to include details of animal welfare and steps taken to ameliorate suffering in all work involving non-human primates. The institution that approved the study must be named, and it must be stated in the paper that the study was conducted adhering to the institution's guidelines for animal husbandry.

Patient privacy and informed consent for publication

Our human participant policy conforms to the Uniform Requirements of the International Committee of Medical Journal Editors:

Patients have a right to privacy that should not be infringed without informed consent. Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives written informed consent for publication. Informed consent for this purpose requires that the patient be shown the manuscript to be published. Complete anonymity is difficult to achieve, and informed consent for publication should be obtained if there is any doubt. If data are changed to protect anonymity, authors should provide assurance that alterations of the data do not distort scientific meaning. When informed consent has been obtained it should be indicated in the published article.

For papers that include identifying information, or potentially identifying information, authors must download the *Consent Form for Publication in a PLOS Journal* (below), which the patient, parent, or guardian must sign once they have read the paper and been informed about the terms of the PLOS content license.

Once authors have obtained the signed consent form, it should be filed securely in the patient's case notes and the manuscript submitted to PLOS should include this statement indicating that specific consent for publication was obtained: “The patients in this manuscript have given written informed consent (as outlined in the PLOS consent form) to publication of their case details.”

Download the PLOS consent form (PDF):

- English
- French
- Portuguese
- Spanish
- Chinese

Clinical trials

PLOS follows the World Health Organization's (WHO) definition of a clinical trial:

> *A clinical trial is any research study that prospectively assigns human participants or groups of humans to one or more health-related interventions to evaluate the effects on health outcomes [...] Interventions include but are not restricted to drugs, cells and other biological products, surgical procedures, radiologic procedures, devices, behavioural treatments, process-of-care changes, preventive care, etc.*

Registering Clinical Trials

All clinical trials submitted to PLOS journals must be entered in a publicly accessible registry approved by the WHO or ICMJE. See the list of approved registries.

PLOS journals consider prospective trial registration (that is, registration before participant enrollment has begun) to be best publication practice, as recommended by the ICMJE. Clinical trials that began to enroll participants before ICMJE recommendations took effect on July 1, 2005 may be retrospectively registered.

More information about trial registration, including the WHO definition of a clinical trial, is in the ICMJE FAQ.

PLOS Medicine is unlikely to publish clinical trials that are not prospectively registered. We recognize, however, that in rare cases late registration may occur for exceptional reasons that merit consideration. Authors seeking evaluation by *PLOS Medicine* of a non–prospectively registered clinical trial must provide a compelling reason for lack of prospective registration.

In addition, as for all PLOS journals, authors wishing to submit a clinical trial that was not publicly registered before participant enrollment began must register the trial retrospectively in a publicly accessible registry. They must also:

- Register all related clinical trials and confirm they have done so in the Methods section
- Explain in the Methods the specific reasons for failing to register before participant enrollment
- Confirm that future trials will be registered prospectively

PLOS journal editors may decline to further consider any clinical trial for which, in the editor's judgment, absence of prospective registration raises concerns of selective publication or selective reporting of research outcomes.

PLOS supports the public disclosure of all clinical trial results, as mandated, for example, by the 2007 FDA Amendments Act. Prior disclosure of results on a clinical trial registry site will not affect consideration.

Required Documentation

Clinical trial reports must adhere to the relevant reporting guidelines for their study design, such as CONSORT for randomized controlled trials, TREND for non-randomized trials, and other specialized guidelines as appropriate.

For all clinical trial submissions, authors must include the following:

- Registration details (reported in the Methods section and in the submission form)
- CONSORT checklist or relevant reporting guideline (uploaded as supporting information)
- CONSORT flow diagram (uploaded as Fig 1)
- Trial protocol (uploaded as supporting information)
- Details of prior approval for human subjects research by an institutional review board (IRB) or equivalent ethics committee(s)

The submission will not be considered if documentation is not provided. The checklist, flow diagram, and protocol will be published with the article if the manuscript is accepted.

The manuscript file must include the following information:

- An explanation of any deviation from the trial protocol

- Description of informed consent obtained from participants
- Any information on statistical methods or participants not indicated in the CONSORT documentation

Systematic reviews and meta-analyses

Reports of systematic reviews and meta-analyses must adhere to the PRISMA Statement or alternative guidelines appropriate to the study design, and include the completed checklist and flow diagram to accompany the main text. Authors must complete the appropriate reporting checklist not only with page references, but also with sufficient text excerpted from the manuscript to explain how they accomplished all applicable items.

Download blank templates of the checklist and flow diagram from the EQUATOR web site.

Abstracts should follow PRISMA for Abstracts, using the PLOS abstract format. Authors must also state within the Methods section of their paper whether a protocol exists for their systematic review, and if so, provide a copy of the protocol as supporting information.

The journal supports the prospective registration of systematic reviews. Authors whose systematic review was prospectively registered (e.g., in a registry such as PROSPERO) should provide the registry number in their abstract. Registry details and protocols will be made available to editors and reviewers, and included with the paper if the report is ultimately published.

PLOS Medicine does not publish narrative reviews except as part of invited Collections

Mendelian randomization studies

Manuscripts reporting a Mendelian randomization study must report results of value to the field and should be reported according to STROBE-MR (Strengthening the Reporting of Observational Studies in Epidemiology using Mendelian Randomization) guidelines.

Reports of Mendelian randomization studies must include a STROBE-MR checklist completed with page number and relevant text. This checklist should be provided as supporting information alongside the submitted manuscript. A blank template is available here:

- Checklist: PDF or Word document

On submission, manuscripts will be assessed for the rationale of the Mendelian randomization study and how it contributes to the base of scientific knowledge in the light of previously published results. If Mendelian randomization studies replicate previously published work, authors must provide a sound scientific rationale for the submitted work and clearly reference and discuss the existing literature

Diagnostic studies

Reports of studies of diagnostic accuracy must adhere to the STARD requirements or alternative guidelines appropriate to the study design (see the EQUATOR web site) and include a completed checklist as supporting information. Authors must complete the appropriate reporting checklist not only with page references, but also with sufficient text excerpted from the manuscript to explain how they addressed all applicable items.

Observational studies

For observational studies, including case control, cohort, and cross-sectional studies, authors must adhere to the STROBE Statement or alternative guidelines appropriate to the study design (see the EQUATOR web site) and include a completed checklist as supporting information. Authors must complete the appropriate reporting checklist not only with page references, but also with sufficient text excerpted from the manuscript to explain how they addressed all applicable items.

For observational studies, authors are required to clearly specify (a) What specific hypotheses the researchers intended to test, and the analytical methods by which they planned to test them; (b) What analyses they actually performed; and (c) When reported analyses differ from those that were planned, authors must provide transparent explanations for differences that affect the reliability of the study's results.

If a prospective analysis plan (from the study's funding proposal, IRB or other ethics committee submission, study protocol, or other planning document written before analyzing the data) was used in designing an observational study, authors must include the relevant prospectively written document with the manuscript submission for access by editors and reviewers and eventual publication alongside the accepted paper. If no prospectively written document exists, authors should explain how and when they determined the analyses being reported.

Microarray experiments

Reports of microarray experiments must conform to the MIAME guidelines, and the data from the experiments must be deposited in a publicly accessible database.

Biological and biomedical research

We recommend authors refer to the BioSharing Portal for prescriptive checklists for reporting biological and biomedical research where applicable.

Animal studies

Studies including animals must follow the ARRIVE guidelines and include a completed ARRIVE Checklist as supporting information. Authors must complete the appropriate reporting checklist not only with page references, but also with sufficient text excerpted from the manuscript to explain how they addressed all applicable items.

Small and macromolecule crystal data

Manuscripts reporting new and unpublished three-dimensional structures must include sufficient supporting data and detailed descriptions of the methodologies used to allow the reproduction and validation of the structures. All novel structures must have been deposited in a community endorsed database prior to submission (please see our list of recommended repositories).

Small molecule single crystal data

Authors reporting X-Ray crystallographic structures of small organic, metal-organic, and inorganic molecules must deposit their data with the Cambridge Crystallographic Data Centre (CCDC), the Inorganic Crystal Structure Database (ICSD), or similar community databases providing a recognized validation functionality. Authors are also required to include the relevant structure reference numbers within the main text (e.g. the CCDC ID number), as well as the crystallographic information files (.cif format) as Supplementary Information, along with the checkCIF validation reports that can be obtained via the International Union of Crystallography (IUCr).

Macromolecular structures

Authors reporting novel macromolecular structures must have deposited their data prior to initial submission with the Worldwide Protein Data Bank (wwPDB), the Biological Magnetic Resonance Data Bank (BMRB), the Electron Microscopy Data Bank (EMDB), or other community databases providing a recognized validation functionality. Authors must include the structure reference numbers within the main text and submit as Supplementary Information the official validation reports from these databases.

Other Article Types

If you are submitting content other than a research article, read the guidelines for other article types.

PLOS Community Action Publishing (CAP) – non member fee support

PLOS Medicine no longer has APCs, and instead is funded by a new collective action model called PLOS Community Action Publishing (CAP). Institutions pay to become community members so their authors are not subject to fees. Corresponding and contributing authors from non-member institutions are subject to non-member fees.

Read the full details about the CAP model.

To find out if your institution is a *PLOS Medicine* CAP member, please visit our institutional partner page and search by your institutional name or by the agreement type “Community Action Publishing.”

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Read the full instructions for submitting to a journal with the CAP Agreement.