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## Computational reproducibility status survey

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## Consent

(2212)

**Please, check the box to consent and participate in the survey. (44388)**

Type: (M/multiple-opt)

**I agree to take part in the survey. (44395)**

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## Section 1 — Demographic Questions (2199)

### How would you best describe your institution? (44036)

Type: (L/list-radio)

Research institute (or research center)

**AO03**

### What is your field of research?

**(44155)**

Type: (L/list-radio)

Social sciences 

**AO06**

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**In which country does your primary university/institution operate? (44077)**

Type: (L/list-dropdown)

AO66 - Germany

**In the context of science and computational reproducibility <sup>2</sup>, which of the following best describes your role or interest? (44184)**

Type: (L/list-radio)

Researchers and Academics

**AO02**

**Which career stage best describes your position? (44185)**

Type: (L/list-radio)

Recognized Researcher - PhD holders or equivalent who are not yet fully independent

**AO04**

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**How many years have you worked in research? (44186)**

Type: (list-dropdown)

AO11 - 10

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## Section 2 — Open Science practices, supporting computational reproducibility <sup>2</sup> (2200)

### How actively do you apply the following practices? (44037)

Type: (F/array-flexible-row)

Frequently - AO03

### Open research (Open Scholarship, Open Science)

(44451)

Never - AO06

### Study Preregistration (e.g., pre-analysis, prospective registration)

(44452)

Never - AO06

### Registered Reports (format of empirical article where a study proposal is reviewed before the research is undertaken)

(44453)

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Rarely - AO05

**Open Materials (making research materials available, e.g., experiment questionnaires, intervention materials)**

**(44454)**

Frequently - AO03

**Open Data (making research data publicly available, e.g., FAIR Data Principles: Findable, Accessible, Interoperable, and Reusable)**

**(44455)**

Frequently - AO03

**Open Code (making research analysis code publicly available)**

**(44456)**

Always - AO02

**Pre-print (publishing manuscripts prior to journal peer-review)**

**(44457)**

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Frequently - AO03

**Open peer review (authors and reviewers are aware of each other's identities)**

**(44458)**

Frequently - AO03

**Open access publication (publication free available, free access)**

**(44459)**

Rarely - AO05

**Replication studies (research attempting to reproduce the methods and findings of prior research)**

**(44460)**

Frequently - AO03

**Using open software(s)**

**(44461)**



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**If a study receives public funding, should the following items be made public?**

**(44078)**

Type: (F/array-flexible-row)

Strongly Agree - AO04

**Data (research data) <sup>?</sup>**

**(44477)**

Strongly Agree - AO04

**Code (research code) <sup>?</sup>**

**(44478)**

Strongly Agree - AO04

**Research documentation <sup>?</sup> (metadata <sup>?</sup> , etc.)**

**(44479)**

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**In your experience, what are the most common reasons why studies are not computationally reproducible? (46381)**

Type: (R/ranking)

**Rank #1:**

AO03 - Lack of standardization in data formats or software tools

**Rank #2:**

AO08 - Incomplete or inadequate documentation (description of methods, metadata, etc.)

**Rank #3:**

AO06 - Differences in data or computational environments

**Rank #4:**

-

**Rank #5:**

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**Rank #6:**

-

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**Rank #7:**

-

**If you tried to reproduce a study (or even a small part of it), estimate the degree of reproducibility you achieved? (in case you have done many, please, provide an averaged estimation) (44273)**

Type: (L/list-radio)

High degree of reproducibility

**AO05**


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**In the publications that you read and/or work with, how often do you see the following items?**

**(44506)**


Type: (F/array-flexible-row)

Sometimes - AO04

**Open data (e.g., to download) **

**(44519)**

Sometimes - AO04

**Open code (e.g., to download) **

**(44520)**

Rarely - AO05

**Metadata (data documentation) **

**(44521)**

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**What resources do you think would be most effective to overcome challenges associated with computational reproducibility? (46382)**

Type: (R/ranking)


**Rank #1:**

AO07 - Dedicated support from institution with data and code preparation

**Rank #2:**

AO12 - Dedicated funding for computational reproducibility 

**Rank #3:**

AO09 - Investment in reproducibility  education and training

**Rank #4:**

AO10 - Creation of computational reproducibility  checklists, guidelines 

**Rank #5:**

AO03 - Journals require data, code, metadata, etc., for publishing a paper

**Rank #6:**

-

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**Rank #7:**

-

**Rank #8:**

-

**Rank #9:**

-

**Rank #10:**

-

**Rank #11:**

-

**Rank #12:**

-

**If you consider using software tools, do coding, versioning, and settings feel overwhelming; What do you think would be a good approach to overcome this barrier? [Please check all that apply] (44690)**

Type: (M/multiple-opt)

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**Not applicable (44697)**

**Hire a software engineer to perform advanced computational tasks (44698)**

**Hire a software engineer to perform documentation (44699)**

**Some training from the institution (44700)**

**In the long run, train Ph.D. students to do all of that (44701)**

**Dedicated support from the institution (44702)**

**Other, please specify:**

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**[Optional] If you have any additional ideas or 'good practices' that could enhance computational reproducibility, and were not addressed in the previous questions, please feel free to share them with us: (44703)**

Type: (T/text-long)



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## **Section 3 — Data publishing (2249)**

**Choose the characteristics that describe the kind of research data you generate [Please check all that apply] (44704)**

Type: (M/multiple-opt)

**Quantitative data (numeric files, survey responses, geospatial, etc.) (44705)**

**Qualitative data (interview, focus groups, field notes, images, audio, video, etc.) (44706)**

**Omics data (information generated by studies ending with -omics: genomics, proteomics, phenomics, etc.) (44707)**

**Imaging data (44708)**

**Disclosive data that are difficult to anonymize (44709)**

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**Commercially sensitive data (44710)**

**Longitudinal data (44711)**

**I do not produce data in my research (44712)**

**Other, please specify:**

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**Section 3 — Data publishing (2250)**

**In the last 5 years, how many datasets have you made publicly available? (44713)**  
Type: (list-dropdown)

AO06 - 4

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## **Section 3 — Data publishing (2213)**

**How do you publish your research data? [Please check all that apply] (44715)**

Type: (M/multiple-opt)

**Data paper (Data in Brief, Scientific Data, etc.) (44716)**

**Supplementary material to a published paper (44717)**

**Data repository (Zenodo, Dryad, Mendeley Data, figshare, etc.) (44718)**

**Institutional cloud (Access restricted to registered users) (44719)**

**Institutional webpage (Open Access) (44720)**

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**Personal webpage or blog (Open Access) (44721)**

**Private (my own) cloud (Access upon request via application) (44722)**

**I do not know (44723)**

**Other, please specify:**

**To what extent do you agree with these reasons for making data publicly available? (44724)**

Type: (F/array-flexible-row)

Disagree - AO05

**My founder requires me to share my data**

**(44725)**

Agree - AO03

**Journal expects data underpinning findings to be accessible**

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(44726)

Strongly Agree - AO02

**My research community expects data sharing**

(44727)

Strongly Agree - AO02

**It is a good research practice to share research data**

(44728)

Strongly Agree - AO02

**It enables collaboration and contribution by other researchers**

(44729)

Strongly Agree - AO02

**It has public benefits**

(44730)

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Strongly Agree - AO02

**Enables validation and /or replication of my research**

**(44731)**

Strongly Agree - AO02

**I can get credit and more citations by sharing data**

**(44732)**

Strongly Agree - AO02

**Improved visibility for my research**

**(44733)**

**What do you consider as barriers to making your research data publicly available? (44734)**

Type: (F/array-flexible-row)

Strongly Disagree - AO06

**I may lose publication opportunities if I share data**

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**(44759)**

Agree - AO03

**Pressure to publish articles (e.g., lack of time)**

**(44760)**

Neutral - AO04

**It is too complex to explain (or document)**

**(44761)**

Agree - AO03

**There are third party rights in my data**

**(44762)**

Neutral - AO04

**Regulatory prohibitions (e.g., legal aspects)**

**(44763)**



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Disagree - AO05

**I am not sure if I have the right to publish it**

**(44764)**

Disagree - AO05

**I do not have sufficient funding to prepare data for sharing**

**(44765)**

Strongly Disagree - AO06

**I do not have permission (e.g., from institution, leader)**

**(44766)**

Neutral - AO04

**Lack of motivation**

**(44767)**

Strongly Disagree - AO06

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**I do not feel any gain**

**(44768)**

Strongly Disagree - AO06

**Other researchers may misuse or misinterpret my data**

**(44769)**

Strongly Disagree - AO06

**Sensitive data**

**(44770)**

Strongly Disagree - AO06

**Confidential commercial use**

**(44771)**

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**[Optional] In case you have other insights in context of limitation of data publishing, please,  
feel free to describe: (44748)**

Type: (T/text-long)

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## **Section 4 — Data reuse (2214)**

**How have you used existing data in your research? [Please check all that apply]**

**(44749)**

Type: (M/multiple-opt)

**Research validation (44914)**

**Replication (44915)**

**Meta-analysis (44916)**

**Background or context to my research (44917)**

**Develop my methodology (44918)**

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**Baseline data (44919)**

**Teaching material (44920)**

**New analysis (44921)**

**I have never used existing data (44922)**

**Other, please specify:**

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## Section 5 — Tools and code publishing (2251)

### Which tools do you mostly use to manage and analyze data? (44790)

Type: (F/array-flexible-row)

Never - AO06

### Analogical: Paper or notebook notes

(44791)

Never - AO06

### Spreadsheet or similar (tabular data like Excel, Libre office Calc, etc.)

(44792)

Never - AO06

### Statistical software (SAS, SPSS, JASP, PSPP, GRETL, SOFA, KNIME, Scilab, etc.)

(44793)

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Never - AO06

**Programming platform (Matlab, Octave, etc.)**

**(44794)**

Sometimes - AO04

**R programming language (with/without RStudio)**

**(44795)**

Frequently - AO03

**Python programming language**

**(44796)**

Never - AO06

**Other programming language (C, C++, Julia, Ruby, Scala, COBOL, Fortran, etc.)**

**(44797)**

Always - AO02

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**Database (SQLite, DBM, MariaDB, Oracle, etc.)**

**(44798)**

**[Optional] In case you use other tools for data analysis, feel free to share: (44799)**

Type: (T/text-long)

**Do you think research code should also be evaluated in the peer review process along with the manuscript? (44800)**

Type: (L/list-radio)

Yes, it should be checked by a human from the journal staff, executed and tested to get the same results

**AO06**

**Indicate all the ways you utilize research code:  [Please check all that apply] (44801)**

Type: (M/multiple-opt)

**I do not use any code at all (44802)**



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**To automate part of the research process (44803)**

**To collect data (44804)**

**To clean data (44805)**

**To organize data (44806)**

**To visualize data (44807)**

**To analyze data (44808)**

**To communicate results (44809)**

**Other, please specify:**



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## Section 5 — Tools and code publishing (2252)

**In the last 5 years, how many code scripts/packages/bundles have you made publicly available? (44714)**

Type: (list-dropdown)

AO05 - 3

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## Section 5 — Tools and code publishing (2215)

**To what extent do you agree with these reasons for making research code publicly available?**

**(44810)**

Type: (F/array-flexible-row)

Disagree - AO05

**My founder requires me to share my code**

**(44820)**

Agree - AO03

**Journal requirement**

**(44821)**

Strongly Agree - AO02

**My research community expects code sharing**

**(44822)**

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Strongly Agree - AO02

**It is a good research practice to share research code**

**(44823)**

Agree - AO03

**It enables collaboration and contribution by other researchers**

**(44824)**

Strongly Agree - AO02

**It has public benefits**

**(44825)**

Strongly Agree - AO02

**Enables validation and /or replication of my research**

**(44826)**

Strongly Agree - AO02

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**I can get credit and more citations by sharing code**

**(44827)**

Strongly Agree - AO02

**Improved visibility for my research**

**(44828)**

**[Optional] In case you have other aspects about code publishing, feel free to comment:**

**(44829)**

Type: (T/text-long)

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**When you publish your own codes, what are the common practices you perform? [Please check all that apply] (44830)**

Type: (M/multiple-opt)

**Not applicable (44895)**

**Use comments to explain the purpose of the code and document all steps in the script (44896)**

**Use a README file to explain the purpose and application of the script(s) (44897)**

**Use version control to track changes and revisions (Git only) (44898)**

**Use code publishing platforms to make the code publicly available in repositories (GitLab, Bitbucket, GitHub, etc.) (44899)**

**Use peer-reviewed sources (such as MethodsX, SoftwareX, etc.) or publish in a book/chapter**


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(44900)

**Publish via community network (ResearchGate, etc.) (44901)**

**Publish via educational network (SlideShare, etc.) (44902)**

**Other, please specify:**

**To what extent do you take steps to ensure that your code is well-documented and easy to reproduce?  (44839)**

Type: (F/array-flexible-row)

Sometimes - AO04

**My research data and computational aspects are easily interpretable, the methods in the paper are enough to reproduce the study, thus no extra metadata or code are needed**

(44840)

Never - AO06



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**Simply add the code as supplementary material as they were in my research computer**

**(44841)**

Always - AO02

**Document dependencies and installation instructions**

**(44842)**

Always - AO02

**Arrangement to freeze (lock, stabilize, hold) code, packages, library versions**

**(44843)**

Always - AO02

**Use containerization tools like Docker**

**(44844)**

Frequently - AO03

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**Use virtual environments (Virtual Machine)**

**(44845)**

Always - AO02

**Use cloud computing resources (i.e., Galaxy project)**

**(44846)**

Frequently - AO03

**Use automation tools to streamline the reproducibility <sup>2</sup> process (Workflow tools, Reprozip, etc.)**

**(44847)**

Always - AO02

**Use code along with notebooks (Jupyter, Rmarkdown, Quarto, etc.)**

**(44848)**

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**[Optional] In case you have other aspects about code documentation, feel free to comment:**

**(44857)**

Type: (T/text-long)

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**What do you consider as barriers to making your research code publicly available? (44858)**

Type: (F/array-flexible-row)

Strongly Disagree - AO06

**Desire to patent**

**(44859)**

Strongly Disagree - AO06

**I may lose publication opportunities if I share code**

**(44860)**

Agree - AO03

**Pressure to publish articles (e.g., lack of time)**

**(44861)**

Strongly Agree - AO02

**Lack of time to build proper documentation**

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**(44862)**

Neutral - AO04

**It is too complex to explain (or document)**

**(44863)**

Neutral - AO04

**I do not have sufficient funding to prepare code for sharing**

**(44864)**

Strongly Disagree - AO06

**I do not have permission (e.g., from institution, leader)**

**(44865)**

Neutral - AO04

**Lack of motivation**

**(44866)**

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Strongly Disagree - AO06

**I do not feel any gain**

**(44867)**

Agree - AO03

**There are third party rights in my code**

**(44868)**

Neutral - AO04

**I am not sure if I have the right to publish it**

**(44869)**

Agree - AO03

**Confidential commercial use**

**(44870)**

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**[Optional] In case you have other aspects about limitations of code sharing (publishing), feel free to comment: (44871)**

Type: (T/text-long)

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## **Section 6 — Code reuse (2216)**

**How have you used existing code in your research? [Please check all that apply] (44872)**

Type: (M/multiple-opt)

**To learn new code strategies (44873)**

**Improve my own code (44874)**

**Research validation (44875)**

**Replication (44876)**

**Teaching material (44877)**



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**I have not used existing research code (44878)**

**Other, please specify:**

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## **Section 6 — Code reuse (2259)**

**What do you consider important when using existing code? [Please check all that apply]**

**(44879)**

Type: (M/multiple-opt)

**Code is obtained from a reputable source (44888)**

**Papers exist based on the code (44889)**

**Code is well documented (44890)**

**Reuse rights are clearly defined (44891)**

**Code can be cited (44892)**

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**Code is openly accessible (44893)**

**Access is immediate (44894)**

**Other, please specify:**