



Prospectus of Achievements

Open Science to Increase
Reproducibility in Science

***Creating Trust in Open
Science & Reproducibility
through Accessibility and
Transparency!***



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OPEN SCIENCE TO INCREASE THE REPRODUCIBILITY IN SCIENCE

Embedding reproducibility in the strategy, design, processes, reporting and dissemination of research should be regarded as a key given for research quality. The reproducibility of research results is fundamental for rigorous science as it confirms or corrects the outcomes of single studies. When research findings can be independently verified, science moves forward with confidence. When studies cannot be reproduced, findings risk being misinterpreted or misapplied.

OSIRIS has been:

- Investigating the underlying drivers and barriers to reproducible research.
- Assessing the evidence and effectiveness of interventions.
- Co-creating and testing interventions to embed reproducibility in research design and reporting.

OSIRIS is a multidisciplinary team of:

- Dedicated early-career researchers.
- Working with experts in open science, reproducibility, metascience, implementation and education.
- co-creating with publishers, funders and researchers.

Reproducibility is understood as a continuum from the reproduction of results—based on the same data, code and methodology—to replication—meaning the repeating of results using the same analytical method, but with different data.



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UNDERSTAND WHAT MAKES REPRODUCIBLE RESEARCH POSSIBLE

OSIRIS has generated one of the most comprehensive qualitative evidence bases on how reproducibility is understood, supported, and constrained across the research ecosystem in Europe.

The largest qualitative study on researchers' perspectives on reproducibility

- One of the broadest available qualitative datasets on researchers' lived experiences of reproducibility.
- Addressing an important gap in previous research that often focused on specific disciplines, single institutions, particular researcher groups, or individual Open Science practices such as data sharing.

60 INTERVIEWS WITH RESEARCHERS ON REPRODUCIBILITY ACROSS EUROPE AND UK

EVIDENCE BASE

60
Researchers

18
Countries

26
Institutions

6
Disciplines

Early Career | Recognised
| Established | Leading

How researchers understand reproducibility



How do they translate it into practice



What does it mean and take to make research reproducible from an everyday perspective



How researchers perceive barriers and facilitators to reproducibility



How these translate it into practice



What skills, support, and conditions do they need



Cross-disciplinary account of how barriers and facilitators unfold in researchers' everyday work: What helps and hinders reproducible research? Researchers' perspectives from a cross-disciplinary interview study

Why this matters

- By engaging with a broad and diverse sample of researchers, the study gives insight into how barriers and enabling conditions for reproducibility emerge differently across research environments.
- Rather than treating reproducibility as a checklist of isolated obstacles and solutions, we approach it as a broader research-system issue: reproducibility is shaped by interactions across multiple layers of the research ecosystem.
- Reproducibility cannot be strengthened by one-size-fits-all interventions. A challenge can take different forms depending on discipline, method, career stage, institutional setting, or available support structures.

Take away

Effective interventions must be adapted to disciplinary and methodological contexts, supported by adequate resources and training, and aligned with incentive systems that reward transparency and rigour.

We translate findings into stakeholder-specific leverage points and recommendations for institutions, funders, journals, research communities, and researchers, designed to support a more inclusive, realistic, and sustainable approach to strengthening reproducibility.

At the final OSIRIS conference, participants will discuss how findings translate into concrete action for institutions, funders, journals, research communities, and policy actors.



DATASET

<https://doi.org/10.48804/FMK8FK>



PUBLICATION

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0348512>



From definitions to practice: how researchers understand and execute reproducibility

Why this matters

- By engaging with a broad, diverse sample of researchers, the study provides insight into what reproducibility means to different researchers and how they try to make their own work reproducible.
- Rather than assuming one definition, we explore the varied ways researchers describe reproducibility and examine it as a set of practical behaviours.

Take away

The findings help explain why reproducibility policies can be misunderstood or unevenly implemented and help think beyond compliance: what kinds of language, training, and support actually make reproducibility meaningful and operationalised to researchers.

Bringing stakeholders into the conversation: focus groups on reproducibility roles, responsibilities and action

Why this matters

- Factors influencing reproducible research span all stages of the research process and are shaped by the wider research funding, governance, support, evaluation, and communication systems: improving reproducibility requires coordinated action across the research ecosystem.
- Stakeholder perspectives are not just background information, but are analytically central to understanding reproducibility reform.
- Current evidence shows a growing focus on reproducibility, but offers limited insight into how multiple stakeholder groups understand and negotiate their roles to support it.
- We examined how reproducibility is perceived, how responsibilities are distributed, where gaps or overlaps exist, and how different actors envision the future of reproducibility support.

Take away

The final OSIRIS conference brings participants across stakeholder groups together to compare perspectives, and discuss the evidence, the shared responsibility and way forward for reproducible research.

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7

Stakeholder focus
groups

58

Participants

6+

Stakeholder
communities

Funders | Journals |
Institutions | Research
support | Reproducibility
networks | Civil society

Support for reproducibility through policies and guidelines of funders, journals and research Institutions

Why this matters

- Transparent and open practices are thought to be a key driver of reproducibility, making it essential to understand how and what key stakeholders require of researchers.
- By examining the policies, guidelines and services of funders, academic research institutions, and journals, we can understand how reproducibility-enhancing practices are required or encouraged throughout the research lifecycle.
- This provides a key overview and baseline of where the European scientific landscape currently stands in encouraging and promoting more transparent, open, and reproducible research.

Take away

There is substantial variation among key stakeholders in how practices deemed important by the research community for transparency and openness are required or encouraged. Data sharing is the most mature area with requirements and infrastructure for its dissemination. Data can include other outputs, such as materials and code, but overall, the requirements for sharing these outputs are less common. Organisations across academia should examine how they can better promote transparent, reproducible science within their respective domains.

EVIDENCE BASE

20

Journals — top 20
for H2020
publications

29

Public funders —
largest funder per
EU country + UK +
Horizon

20

Higher education
institutions — top
H2020 award
recipients
Transparency and
Openness
Promoting
Guidelines (TOP
2025)



FINDINGS AND REPORT

<https://osf.io/2v3we/o/verview>

2

DEVELOP AND TEST EVIDENCE-BASED SOLUTIONS

Consensual reproducibility checklist to support assessing and reporting reproducibility practices in studies

Why this matters

- Developed by a multidisciplinary group interested in research, open science, and reproducibility.
- Agree on minimum requirements for core expectations in research planning, methods, data collection, management, analysis, and results dissemination.

Take away

Consensus on key open science and transparency practices that promote reproducibility across the different stages of a research project.

A tool to improve the reproducibility of methods and results through all phases of the research process and to promote a cultural shift toward transparent, reliable research.

Invitation to pilot-test the checklist, refine optimal application, and demonstrate whether its use leads to tangible improvements.

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82

Experts

21

Countries

2

Delphi rounds

16

Panel member
for consensus

32

Core reproducibility
items



PUBLICATION

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3003726>



Computational reproducibility in practice

Why this matters

- Computational reproducibility is essential to ensure that research findings can be verified, reused and trusted.
- Lack of time and funding hinders data and code sharing, while insufficient documentation is a major barrier to computational reproducibility.
- This limits transparency and the broader reuse of scientific knowledge.

Take away

Researchers are supportive of open science and recognise the value of sharing data and code, but awareness alone is not enough.

Stronger incentives, practical training, and institutional support are needed to embed reproducible research into routine research practice.

Real change requires both individual good practices and systemic support.

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35
Question
survey

133
Research
worldwide

120
Active
researchers

5
Disciplines



DATASET

<https://doi.org/10.17605/OSF.IO/6YSRH>



PUBLICATIONS

<https://doi.org/10.12688/f1000research.172013.2>





Assessing preprints for reproducibility

Why this matters

- Test intervention: use of the OSIRIS reproducibility checklist where it applies to preprints.
- Control group: generic information about scientific integrity.
- Evaluate whether feedback from reproducibility checks can increase data sharing, code sharing and reproducible research practices in preprints and/or published papers: feedback posted on a preprint server and sent to the corresponding author.
- Assess outcomes from a published paper.

Work in progress

- Ongoing randomised controlled trial.
- Last preprint included: 2 December 2025.
- Final outcome assessment planned: December 2026 (12 months after inclusion of last preprint).

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274

Preprints

8

Evaluators

Experimental
randomised
control trial

*medRxiv | aRxiv | bioRxiv
|agriRxiv | agriXiv*



REGISTRATION

[https://doi.org/10.17605/O
SF.I0/39JS8](https://doi.org/10.17605/O
SF.I0/39JS8)

Observatory of open science practices in biomedical journals

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10

Leading
biomedical
journals

15 624

Papers

9

Tools

13

Open science
practices

Observational
study

Why this matters

- Monitoring open science practices is essential to incentivise transparency in research.
- Provides a foundation for developing an open science practices observatory.

Take away

Leading medical journals demonstrate only partial implementation of open science policies. Transparency is higher for randomised controlled trials than for other study designs. Automated assessments of published articles currently lack accuracy for cross-journal comparisons and individual article evaluations, but can detect changes in open science practices following major journal policy reforms.



PREPRINT

<https://www.medrxiv.org/content/10.1101/2025.11.26.25341061v1>



From promise to practice: do open science commitments in grant proposals translate into research publications

Why this matters

- Insight into the often-overlooked research lifecycle stage from funding application to publication: grant proposals with ambitious commitments for transparent publications versus implementation influenced by practical constraints and the level of accountability embedded in funding systems.
- Findings suggest that open science practices are implemented more frequently in publications than originally promised in grant proposals.
- Commitments made at the funding stage do not always translate directly into research outputs.
- More adoption of open science practices in publications may be supported by factors beyond funding requirements, such as journal policies encouraging the sharing of materials and data during manuscript submission, or institutional support for open access publishing.

Take away

- Research funders can strengthen their policies for integrating open science practices into funding calls.
- Monitoring, guidance, and clearer expectations throughout the research process may be needed to support implementation.
- Encouraging open science at the research proposal stage is an important first step, but achieving reproducibility in research requires commitment through all research cycles.

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101

Matched pairs of grant proposals-publications

28

Major funders

12

Regio's / countries

Observational study



OUTPUTS



STUDY REGISTRATION
<https://doi.org/10.17605/OSF.IO/EMNDF>



PREPRINT
https://osf.io/preprints/metaarxiv/jvuze_v1



DATA AND ANALYSIS CODE
https://github.com/ayudewi/os_funders



Can journal interventions improve open science? evidence from a randomised controlled trial

Why this matters

- Test intervention: are authors more likely to adhere to open science if reviewers are prompted to systematically consider open science elements practices in submitted manuscripts
- A scalable and relatively low-cost mechanism for journals to promote more reproducible research.
- Preliminary findings: introducing checklists alone may not automatically lead to substantial improvements in reported open science practices.
- Adoption appears to depend on broader contextual factors, editorial workflows, author responsiveness, and how strongly journals integrate transparency requirements into publication decisions.

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2

Biomedical journals

400

Manuscripts

Experimental
randomised
control trial



STUDY REGISTRATION

<https://doi.org/10.17605/OSF.IO/ZNQ28>

Take away

Promoting open science requires more than introducing reporting tools. It requires aligning incentives, editorial processes, and implementation strategies across the research ecosystem.

Can funders predict reproducibility before research begins: insights from grant proposal review

EVIDENCE BASE

101

Granted proposals

Experimental non-
RCT study

Mock review

OUTPUTS



STUDY REGISTRATION

<https://doi.org/10.17605/OSF.IO/NS4V9>



PREPRINT

https://osf.io/preprints/m-etaarxiv/dvhux_v1



DATA AND ANALYSIS CODE

https://github.com/ayudewi/os_funders

Why this matters

- Can assessment of proposed open science and transparency practices in grant proposals, using an open science checklist, predict reproducibility of resulting publications.
- Do proposals with stronger commitments to transparent research practices lead to reproducible findings: If reproducibility can be predicted during grant review, funders could incorporate these indicators into decision-making processes and incentivise better research practices before projects begin.
- Findings suggest that predicting reproducibility at the proposal stage is challenging.

Take away

Research quality and reproducibility are influenced by multiple factors that evolve during project implementation, making early prediction inherently uncertain. But indicators related to research transparency may provide useful signals for improving funding assessments. Research reproducibility should not be assessed only after publication. Funding decisions can offer an earlier opportunity to encourage and support reproducible science.

3

ENGAGING RESEARCHERS, STAKEHOLDERS AND THE PUBLIC

The **OSIRIS network of researchers** — with many early career researchers — participates in all OSIRIS RCTs.

Ten tales of reproducibility provides inspiring examples of reproducibility practices for and by stakeholders, identified through OSIRIS research. Cases include **bottom-up and top-down initiatives** by research institutions, journals, funders and the research community. They convey successes, challenges, lessons learned and wider applicability. These ten tales can inspire organisations on best practices they can implement.

Public engagement with reproducibility is crucial for fostering trust in science. OSIRIS organised **fun public events** where the importance of reproducibility in research was showcased through the example of **baking Christmas tree meringues**.



RESOURCES

https://osiris4.eu/wp-content/uploads/2025/06/OSIRIS_PDF_FINAL-Ten-tales-of-reproducibility-A4-CMYK.pdf



RESOURCES

<https://journals.plos.org/plosbiology/article?id=10.1371/journal.pbio.3002953>



RESOURCES

<https://link.springer.com/article/10.1186/s41073-025-00167-x>





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