The background features a dark blue field filled with vibrant, multi-colored light trails in shades of purple, blue, and yellow. These trails form swirling, concentric patterns that create a sense of depth and movement. In the lower right foreground, a human hand is visible, with the index finger pointing towards a bright, glowing yellow and orange point of light that serves as the focal point of the composition. The overall aesthetic is futuristic and scientific.

The positivity trap: is a bias against null results in research literature holding back science?

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SPRINGER NATURE

1

What are null results and why are they worth talking about?

Null results in research: essential for science

Null results, which in this context includes negative or inconclusive results, are outcomes that do not confirm the hypothesis of a research project

Arriving at null results is a natural part of research, and sharing such findings can:

- **Inform** other researchers that the original line of research did not support the hypothesis
- **Prevent the duplication** of unnecessary research, saving time and funding
- **Inspire** new hypotheses or methodologies in relation to the research topic
- Increase **transparency** and **reproducibility** in research
- **Accelerate** the advancement of scientific discoveries

Null results in research: essential for science

Not sharing null and inconclusive results contributes to research waste. A study prepared for the European Commission estimated in 2018 that up to **€26 billion in Europe alone has been wasted** due to duplicated work stemming from a lack of awareness, or access to, existing research data or null results.¹

Other studies have shown that the National Institutes of Health is costing US taxpayers over **\$100 million per year due to research waste** through unreported trials.^{2,3}

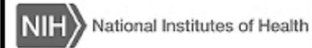
NIH waste far over \$100 million in medical research funding every year – new study

Research waste at the National Institutes of Health is costing U.S. taxpayers far over \$100 million per year, a **new study** published today suggests.

Combing through NIH grants that were completed during 2017-2019, researchers found 137 clinical trials involving 41,501 children that had never made their results public in any form. The trials were funded through NIH grants worth \$362 million.

Research waste at NIH 2017-2019

- Results of 200 pediatric trials missing
- Data from >41,501 children lost
- 48% of results never made public
- **\$362 million in taxpayer-funded grants**



Invisible medical research benefits nobody.
This is unethical and a waste of public money.

<https://jamanetwork.com/journals/jama/fullarticle/2801689>

Other key findings:

- 39% of all applicable NIH funding was awarded to grants with unpublished results
- 36% of pediatric trials had not been prospectively registered
- Only 24% of trials had uploaded results onto ClinicalTrials.gov

Cost of not having FAIR research data

Cost-Benefit analysis for FAIR research data

1. European Commission. (2018). Cost of not having FAIR research data: Cost-benefit analysis for FAIR research data (p. 26). <https://doi.org/10.2777/02999>

2. Bruckner, T. (2023). NIH waste far over \$100 million in medical research funding every year – new study. <https://www.transparimed.org/single-post/niH-research-waste>.

3. Rees, C. A., Narang, C., Westbrook, A., & Bourgeois, F. T. (2023). Dissemination of the results of pediatric clinical trials funded by the US National Institutes of Health. JAMA, 329(7), 590–592. <https://doi.org/10.1001/jama.2022.24025>

Null results in research: under-reported

Yet despite the importance of them, the publishing of null results as peer-reviewed research papers is in decline, with researchers often opting to share such work informally at conferences or directly with peers.

Limited studies have been made on this topic, identifying barriers such as traditional research assessment's focus on citations, which put null results at a disadvantage.^{4,5}

4. Nature (May 2024). Illuminating 'the ugly side of science': fresh incentives for reporting negative results. <https://doi.org/10.1038/d41586-024-01389-7>
5. Be positive about negatives—recommendations for the publication of negative (or null) results, European Neuropsychopharmacology <https://doi.org/10.1016/j.euroneuro.2019.10.007>.

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CAREER FEATURE | 08 May 2024

Illuminating 'the ugly side of science': fresh incentives for reporting negative results

New data repositories and alternative journals and workshops offer routes for sharing negative results – which could help to solve the reproducibility crisis and give machine



ELSEVIER

European Neuropsychopharmacology
Volume 29, Issue 12, December 2019, Pages 1312–1320

Review

Be positive about negatives—recommendations for the publication of negative (or null) results

Anton Bespalov ^a, Thomas Steckler ^b, Phil Skolnick ^c

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Abstract

Both positive and negative (null or neutral) results are essential for the progress of science and its self-correcting nature. However, there is general reluctance to publish negative results, and this may be due a range of factors (e.g., the widely held perception that negative results are more difficult to publish, the preference to publish positive findings that are more likely to generate citations and funding for additional research). It is particularly challenging to disclose negative results that are not consistent with previously published positive data, especially if the initial publication appeared in a high

2

The State of Null Results

Null results: the researcher perspectives

To have a better understanding of researchers' experiences with null results, in 2024 Springer Nature initiated one of the largest surveys of its kind, asking over 11,000 researchers their perspectives on the sharing of null results.

The result was the white paper, *The State of Null Results*⁶.



6. Springer Nature (2025, July). *The state of null results: Insights from 11,000 researchers on negative or inconclusive results*. <https://stories.springernature.com/the-state-of-null-results-white-paper/index.html>

From the survey results, we could report that null results are an important part of the research ecosystem:

- **Over half (53%) of researchers have generated null results, and an overwhelming majority (98%) recognise their value.**
- The top three benefits experienced by those who have published null results in a journal included:
 - **Inspiring a new hypothesis or methodology in relation to the research topic (39%)**
 - **Helping identify issues with the methodology (29%)**
 - **Preventing the duplication of unnecessary research (28%)**

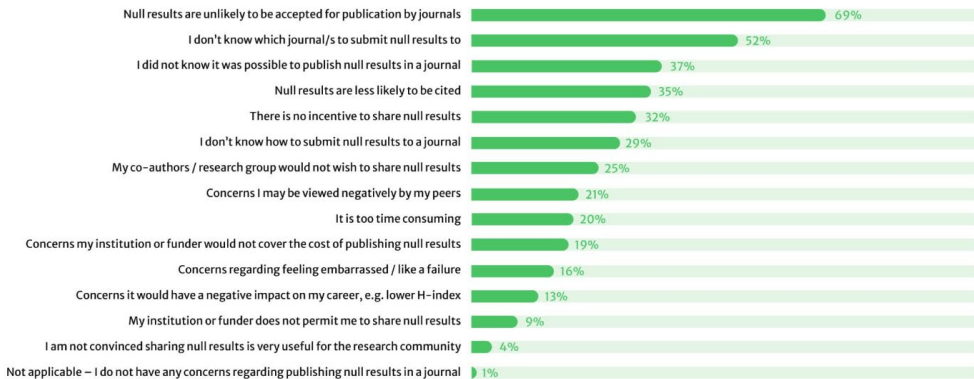
Yet, as we had hypothesised, a gap remains in translating this to the scientific record:

- **85% of surveyed researchers believe that sharing null results is important**
- **But only 68% of those who have generated null results have shared them in some form**
- **And less than a third (30%) have submitted these to a journal**

3

**Why are null results
under-reported in
published literature?**

Which of the following concerns, if any, do you have about publishing null results in a journal?
Please select all that apply.



What were the barriers to publishing null results?

Researchers listed several challenges to publishing null results, including:

- concerns about negative bias leading to reputational harm
- a lack of clarity on where to publish
- a low likelihood of journal acceptance
- lack of support.

Only 15% are aware of journals that actively encourage null result submissions

More than half (55%) of researchers surveyed were unaware of institutional or funder support to share null results.

Bias and reputation risk

Researchers reported negative connotations to terms such as 'negative results' (which was one of the two top-reported terms used, alongside 'inconclusive results').

“I will not say these are negative results. If we did our experiments properly without any mistakes then [the] data that we get still describe a new result.”

– Malaysia, Medicine, PhD or Master's Student in a University/College

Researchers also felt that publishing null results could have a negative impact on their career or reputation.

These concerns align with previous findings⁷ on the reliance on quantitative metrics, such as citations and Journal Impact Factors, which do not incentivise the publication of null results.

7. Springer Nature. (2025). The state of research assessment: Researcher perspectives on evaluation practices. <https://stories.springernature.com/state-of-research-assessment>

Lack of clarity on how and where to publish null results

For those who have generated null results and think that sharing them is important, but who did not share or try to share them, the second biggest concern is not knowing which journal to submit null results to (52%). Additionally, 29% also responded that they do not know how to submit null results to a journal.

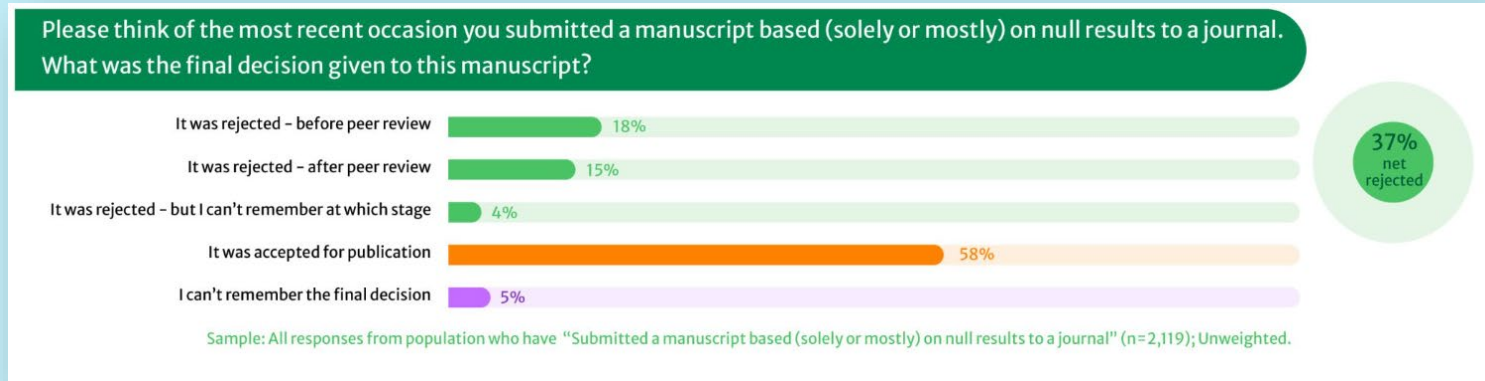
Across all survey respondents, only 15% of researchers were aware of a journal that encourages publication of null results.

This is where there can be clear recommendations for publishers, to ensure journal policies are clear where journals welcome work reporting inconclusive or null results. In addition there is work to be done on raising awareness of article types such as registered reports, which can aid in the unbiased reporting of inconclusive data.

A perceived low likelihood of journal acceptance

Most researchers felt that null results would mean a paper was less likely to be accepted at a journal (82%). This was also listed as the number one concern around sharing null research by 69% of the researchers who had generated such work, agreed they were important and had not tried to share them.

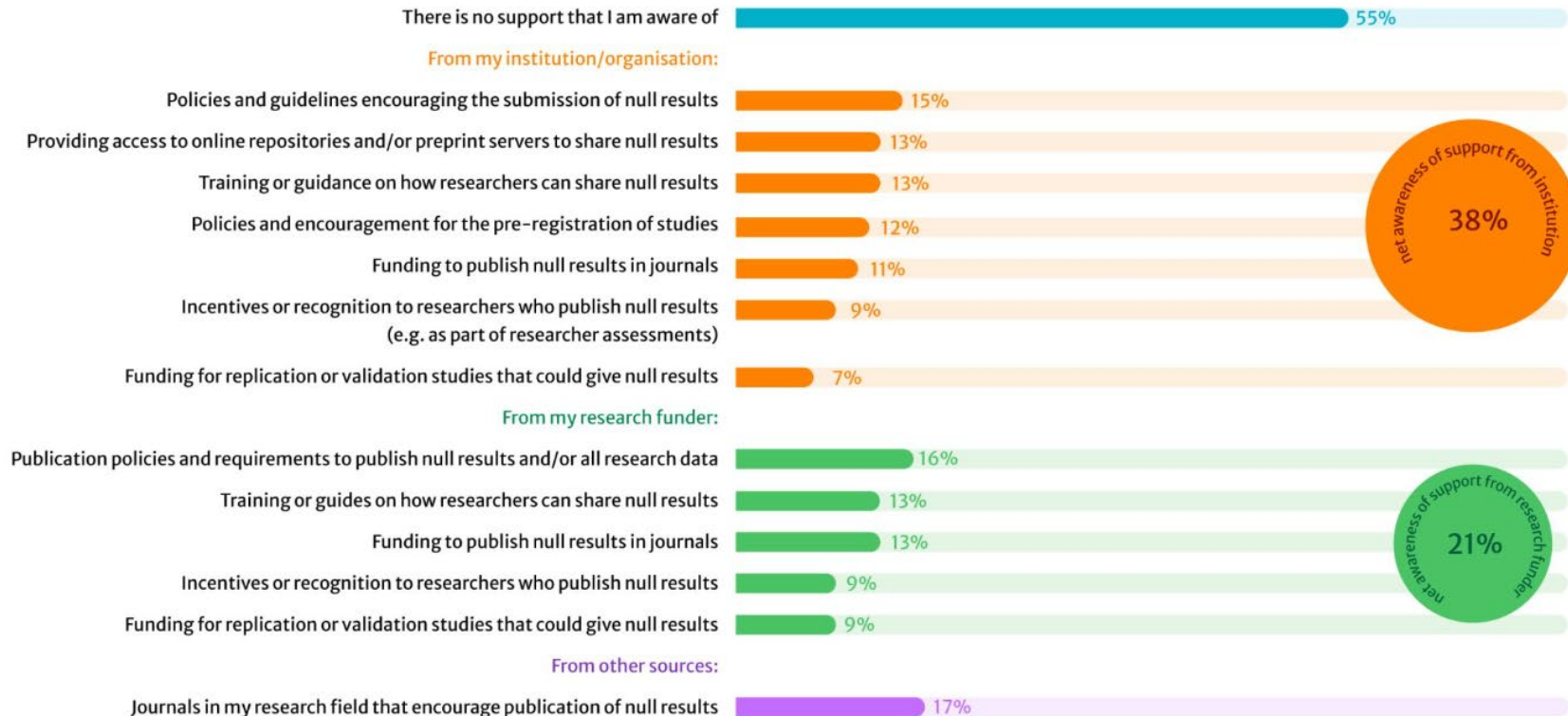
Of those who had submitted a manuscript based solely or mostly on null results, 58% reported that it was accepted, 37% reported it was rejected, and 5% could not remember. Most (93%) felt the null results played a part in the decision



The perception of low acceptance rates leads to a scepticism towards investing time into papers based on null results, with concerns around them being too time consuming to outweigh the disadvantages of writing a paper based on null results.

Null results: the barriers

To your knowledge, what support around sharing null results is currently available to you?



Sample: All responses (n=11,069); Unweighted.

Based on these finding, what are our next steps?

More data: we should continue to study this aspect of the publishing ecosystem, so as to further our understanding of a complex issue, and to learn more about the attitudes of researchers and other elements of the academic and publishing community.

We can, however, already draw some idea for what we need to do collectively to face these challenges:

- **Increase visibility and support: Journals, institutions, and funders should clearly communicate policies and provide resources for publishing null results**
- **Promote cultural change: Educational campaigns and success stories can normalise the sharing of null results, reduce stigma, and showcase the benefits of publishing**
- **Reform research assessment: Broaden evaluation criteria so that all rigorous research, regardless of outcome, is recognised in research assessment**

THANK YOU

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