

The Sieve and the Shield: Preserving Scientific Integrity in the Era of Publication Deluge

Shrikanth N Hegde*



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Publishing scientific communications is an important means of sharing the results of scientific experiments, and scientific journals are the vehicle for disseminating such information. The output of publications has been advancing rapidly, and it is estimated that >3 million articles are published in approximately 46,000 journals each year.¹ Medical journals historically gained trust by rigorously peer reviewing to meet strict moral, ethical, and scientific standards. In the last decade, there has been an exponential growth in the number of published articles. This is not matched by the growth in researchers qualified to review the articles. Editors find it difficult to get qualified reviewers, and scientists are overwhelmed by the number of new articles, described as “a strain on scientific publishing.”² This landscape is further clouded by the growth of predatory journals with poor or absent peer review processes, poor-quality articles, and a lack of transparency.³ An increasing number of fake research articles are being produced by the “paper mills,” fraudulent organizations that make money by selling fake articles to academic customers. Many such fake articles get published even in good-quality journals.⁴

Articles are being written using artificial intelligence (AI) tools and are becoming increasingly difficult to detect. With the growing trend of recognizing publications as a metric of academic progress, researchers are driven by the culture of “publish or perish” and prioritize quantity over quality, which is driving high publication output and the growth of the publication industry (both genuine and predatory).⁵ It is important for a discerning reader to sieve through the information and be aware of the nuances of critical appraisal of an article. Because individual researchers are overwhelmed by this volume, journals can no longer act as passive repositories but must actively step forward to fulfill a dual institutional responsibility: acting as a sieve to filter out compromised data and a shield to protect the collective evidence base from ideological or methodological distortion.

THE ANATOMY OF PUBLICATION DELUGE AND THE EFFECT ON TRUST

To understand how the deluge of literature affects trust, we must understand how the hyperpublishing boom works. Analyzing the strain on scientific publishing, a study of the publishing industry reveals that the most recent growth is concentrated in specific for-profit open-access publishing models that aggressively utilize “special issues” handled by temporary guest editors. Between 2016 and 2022, publishers saw exponential growth in article output due to increased article output from the special issues. Peer review requires independent, qualified experts to dedicate considerable, uncompensated time to assess the manuscripts. However, the special-issue model frequently compresses this timeline into an increasingly homogeneous, rapid-processing frame. For example, mean turnaround times from submission to acceptance at some mega-journals have dropped to as low as 37 days, with a flat distribution curve in which articles across vastly different fields are approved in identical, rapid timeframes.²

While the growth in scientific literature is welcome, especially when it comes from the global south and developing countries with improved research capabilities, a surge driven by commercial interests undermines trust. Institutional mandates for publication, a publish-or-perish culture, and the exploitation of these pressures by predatory journals and paper mills, together with shortened turnaround times, have created a publication deluge that erodes trust in the system. When peer review is compressed or manipulated, low-quality, biased, or entirely fabricated studies leak into the literature. One journal was found to publish a supplement issue containing >11,000 pages, with articles on every possible subject!⁶ Scoping reviews show that articles from presumed predatory journals or paper-mill operations are routinely cited in high-tier evidence syntheses, with

some large Cochrane reviews finding that up to 9% of included clinical trials originated from dubious sources.³ With fast-track papers lacking rigorous data checking, peer review ceases to be an independent quality check and instead becomes a vehicle for propagating disinformation under a trusted brand. These factors have also led to an increase in the number of retracted articles globally, with as many as 65,000 retractions recorded as of 6th June 2026, according to Retraction Watch, a website that maintains an online database of retracted research articles.⁷ When an article is published in a high-impact journal, it is considered a “fact.” An example is a 1998 paper linking MMR vaccines to autism, which was retracted in 2010.⁸ But the paper may have caused a decline in MMR vaccination among children for some time, at least.

THE DISCERNING READER'S SIEVE: NEED FOR CRITICAL APPRAISAL OF PUBLISHED ARTICLES

In this changing landscape, it is insufficient to read only the Abstract and Conclusion of a paper. Navigating the literature deluge requires a shift toward intentional, active skepticism. Discerning readers must systematically audit the Methodology and Results sections of a manuscript to identify subtle analytical anomalies.

Identifying Data Dredging and Statistical Manipulation: P-hacking

A famous quote by the British economist Ronald H Coase, “If you torture the data long enough, it will confess to anything,” highlights critical pitfalls in modern statistics, data analysis, and research. Readers must watch out for the common practice of data

Consultant Physician, Department of Medicine, Anushri Medical and Diabetes Care Centre, Shimoga, Karnataka, India; *Corresponding Author

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dredging, also known as p-hacking. In the rush to have publications, investigators may collect many variables and perform endless statistical permutations behind the scenes until an association yields a statistically significant p -value ($p < 0.05$) purely by chance. When a clinical trial fails to meet its primary endpoint, authors may systematically divide their data until they find a narrow patient outcome in which a positive effect appears. Unless these specific subpopulations and analytical models were explicitly prespecified in an independent trial registry before data collection began, such findings represent random statistical noise rather than genuine biological cause and effect.⁹

Validity of the Surrogate Endpoints

A major problem in some clinical trials is substituting soft endpoints (e.g., blood pressure or biomarker reductions) for hard endpoints (e.g., stroke reduction, all-cause mortality) and treating them as proxies for the hard endpoints. In clinical practice, benefits observed on soft endpoints may not translate into a discernible reduction in hard endpoints. Systematic evaluations of oncology drug approvals reveal that up to 67% of contemporary cancer therapies are authorized by regulatory bodies based entirely on surrogate endpoints such as progression-free survival or response rates. However, long-term follow-up demonstrates that a vast majority of these drugs subsequently fail to show any true benefit in overall survival, with some causing significant subsequent toxicity.¹⁰

Citation Gaming: Impact Inflation

Citations are often used as a proxy for journal quality, but this metric is also susceptible to manipulation and attempts to inflate it through self-citation and coordinated "citation cartels." According to Goodhart's law, when a measure becomes the target, it ceases to be a good measure, a principle that applies to citation metrics as well.²

Methodological and Bibliometric Health

It is important to conduct a quick audit of the information source, including the journal's indexing status in major databases such as MEDLINE, Scopus, and Web of Science, and to review transparent policies on data availability, authors' competing interests,

funding sources, and the role of sponsors in the study to assess whether the information is unbiased and trustworthy.

THE ROLE OF THE JOURNALS IN PRESERVING SCIENTIFIC INTEGRITY

- The restoration of scientific trust cannot rely solely on the vigilance of the individual reader; it requires institutional leadership. Flagship national medical journals, such as the Journal of the Association of Physicians of India (JAPI), are uniquely positioned to serve as the premier sieve and shield for the local scientific community. As independent entities, free from the commercial imperatives of international publishing conglomerates, these journals can enforce a uniform quality benchmark that prioritizes clinical truth over sheer quantity.
- Apart from the mandatory disclosures of financial conflicts of interest from authors and reviewers, persistent digital identifiers such as ORCID, nonfinancial conflicts of interest, and disclosures of roles/positions within the organization/association would bring greater transparency.
- A regular peer review may not be sufficient to detect data anomalies; editorial workflows should integrate review by statistical experts who screen for statistical plausibility, check for data smoothing, overfitted parameters in small sample sizes, and timeline discrepancies such as immortal time bias.
- Journals must actively work to transform peer review from an invisible, voluntary task into a recognized, rewarded academic achievement. By introducing dedicated critical appraisal columns, journal clubs, and research literacy continuing medical education (CME) initiatives, journals can train the next generation of physicians to evaluate the literature.
- Adoption of technology: Use of AI for detecting data or image manipulation and AI-generated texts and figures can serve as an effective sieve for filtering out fake manuscripts at the initial stages, saving the precious time of the editorial team and the reviewers. Many major publishing houses have developed in-house AI tools, and many more will adopt them sooner or later.

They are expected to help the journals fight against paper mills.^{11,12}

Many editorials have expressed concern about the growing trend of declining scientific integrity and fraud and have described various approaches to combating it.^{6,8,13} Ultimately, science remains a self-correcting enterprise only if its practitioners actively engage in the process of correction. By serving as a meticulous sieve and an unyielding shield, trusted national medical journals ensure that the clinical literature guiding patient care remains anchored in undisputable evidence rather than in data noise.

ORCID

Shrikanth N Hegde  <https://orcid.org/0000-0003-2487-2711>

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