Good research conduct: an update

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ABSTRACT
This review discusses the developments affecting research integrity over the past decade.

BACKGROUND

In 2015, an *Archives* review of good research conduct covered duplicate publication, conflict of interest, authorship, data management, research fraud and the research environment.[1] This present article reviews what has changed in this area over the past decade.

Increased postpublication scrutiny

In 2012, the website PubPeer was launched as a postpublication peer review hub which allowed anonymous posts. One of its co-founders, Dr. Brandon Stell, a French neuroscientist, said in an interview that he was inspired by his experience of journal clubs where he thought, "Wow, people just eviscerated that paper, and I wonder what the author's response would be, or I wonder what other journal clubs think."[2] Although originally intended as an online journal club, it has become a platform for posting allegations of falsification, fabrication, plagiarism, duplicated images and, most recently, artificial intelligence (AI)-generated text. Comments posted on PubPeer have led to major research misconduct investigations, as well as identifying honest errors that have led to corrections of the scientific literature. Furthermore, the increasing use of pattern recognition software by PubPeer users has led to the identification of manipulations where images have been, for example, duplicated, stretched, cut and inverted. Such is the impact of PubPeer that the site provides free browser extensions which generate alerts when comments are posted on one's own research paper.

Public posting of comments on errors in publications is not without its problems. One issue is when personal attacks occur. A recent case report of a retraction (box 1) highlights that there is a human being at the other end of an allegation who can suffer emotionally.[3] Dr Stell of PubPeer is quoted as saying, "It's a misconception that, because it's anonymous, people can leave whatever comment they want on the site, but actually we have a strict moderation policy"[4]—a policy that includes the removal of extreme exaggeration for emphasis.[5] ResearchGate is another website that previously allowed users to post comments on papers, but removed this feature since these 'were not providing sufficient benefits to the researchers who engage with the feature or authors whose work is commented on'.[6] Another issue is when posted comments are indiscriminately passed on by users onto institutions as de facto allegations of misconduct. On one hand, as a recent paper by Caron *et al*[7] concluded, research integrity officers "cannot spend every waking hour reviewing comments on PubPeer, blogs and social media" and on the other hand, "there is a need to evaluate serious concerns". How to manage this wicked problem remains unclear. Overall, there is no doubt that social media and websites hosting comments on publications have opened up research to much greater scrutiny—a positive trend that is likely to continue. But it is still good academic manners to first write to the journal and authors—as long as the journal makes this process as easy as posting and provides feedback.

Data storage

Advances in information technology over the past decade have greatly facilitated data integrity and storage. For example, the UK's National Institute for Health and Care Research (NIHR) has guidelines on how to manage data underlying publications, including the requirement that data must be deposited in an appropriate data repository, guidance on what repositories are available and need for persistent identifiers and sharing of related software and code.[8] The importance of access to raw data is highlighted in the retraction case study (box 1)—where the analysis error was discoverable because data were lodged with *Nature* at time of publication. Institutions have also improved research integrity training (eg, Queen Mary University of London offers free access to the Epigeum online course) and handling of published data, providing electronic lab books and data archiving. For example, the University of Edinburgh has a digital repository of research data, with a 'deposit data' link clearly marked on its website. Researchers are encouraged to upload their dataset via this link for 'sharing and safekeeping', with a persistent identifier and suggested citation being provided.[9] But some institutions do not have an accessible data archiving service. In this case, researchers should highlight to research deans' evidence of best practice and remind them that access to raw data is essential if concerns are raised post publication.

AI and research integrity

As defined in a report from the UK Reseach Integrity Office (RIO) , AI is 'an umbrella term for a range of algorithm-based technologies that solve complex tasks by carrying out functions that previously required human thinking'.[10] Generative AI such as ChatGPT has huge potential in improving the language of manuscripts, especially for researchers whose first language is not English. Most journals do not preclude the use of AI, but it is essential for all authors to be totally transparent

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Box 1 Timeline of a retraction[3]

- ⇒ Published a paper in *Nature* as first author.
- ⇒ After publication, a publicly available preprint reported significant flaws in the analysis and demanded that the paper should be retracted.
- ⇒ Felt 'disbelief, embarrassment and frustration'.
- ⇒ Drafted a response, correcting the errors in the data set and defending methods.
- ⇒ *Nature* editor sent the response out for peer review, along with the critique.
- ⇒ After peer review, it became clear that the paper should be retracted.
- ⇒ Felt devastated by 'toxic comments' on social media and by peer reviewers.
- ⇒ Offered to resign post but was not accepted since it was considered to be an honest error.
- ⇒ Difficulty in getting subsequent manuscripts published but does not regret the decision to retract.
- ⇒ On reflection:
  - ⇒Appreciates that making data and code for the *Nature* paper openly accessible allowed error to be discovered 'better to be open and accountable, even if it means admitting mistakes'.
  - ⇒Should have reached out to other researchers to get feedback on methods before publishing.
  - ⇒Honest mistakes happen, and researchers should be encouraged, not punished, for doing the right thing and retracting flawed work.
  - ⇒Retracting a paper is an opportunity to learn and improve.

and read instructions for authors carefully. Advice on using AI is rapidly evolving, with publishers such as Wiley providing up-to-date guidance.[11] Overall, AI should never change the intellectual meaning of a manuscript, and authors must check and always be responsible and accountable for their outputs. Transparency clearly needs to be improved, since a study by the American Association for Cancer Research found that in 10 of their journals over a 6-month period, 36% of the abstracts in 7177 submitted manuscripts contained at least some AI-generated text but on submission, only 9% disclosed AI use.[12] More positively, AI has the potential to transform how data are used for research. For example, AI-generated synthetic data are model datasets with statistical properties that reflect, but do not include, original data. In future, it may therefore be possible to freely share and analyse synthetic data from National Health Service patients.[13]

Educating researchers, peer reviewers and editors about AI is a high priority to maintain publication quality. Areas to be addressed include (1) to be careful not to breach funder's conditions and to violate intellectual property or confidentiality, (2) to ensure that personal data cannot be re-identified, (3) to verify citations very carefully, (4) to understand that AI cannot take responsibility for research outputs, and (5) to be aware that using AI for confidential information, for example, in peer review, may breach professional standards.[10] And in some cases, AI facilitates research misconduct. For example, journals are seeing submissions containing hallucinated references and tortuous phrases (eg, the term 'AI' being called 'counterfeit consciousness'[14]) that indicate use of paraphrasing tools to prevent plagiarism from being discovered.[15] AI is also prone to insert 'careless speech' that, although appearing entirely plausible, contains factual inaccuracies and biased information.[16] AI also supports fraudulent submissions from 'paper mills' where manufactured manuscripts are submitted to journals for a fee on behalf of researchers with the purpose of providing an easy publication and boosting self-citations.[17]

Open access

It is now much easier to publish now than in 2015. In the past, journals were either linked to academic societies or to well-established academic publishers. The move to open access and pay for publication means that, for some journals, quality checks and interest in pursuing misconduct allegations are either not a high priority or, in the case of 'predatory journals' (publications that misrepresent themselves as scholarly journals for financial gain despite not meeting scholarly publishing standards[18]), no quality checks at all. Zhuang *et al*[19] identified over 100 'questionable open-access journals' showing indicators of low editorial standards. And a study by Richardson *et al*[20] concluded that there is accumulating evidence that large-scale production of low quality and fraudulent science is not limited to certain regions of the world and that some publishers and their editors 'provide credibility to these practices'. If current trends continue, researchers will spend a great deal of time distinguishing low-quality content from genuine research. And AI is not making this easier. For example, in an analysis of papers from the US National Health and Nutrition Examination survey, Suchak *et al*[21] found formulaic research articles that were probably generated by direct-to-AI pipelines, where additional papers were generated by reversing dependent and independent variables, and increasing the number of combinations of predictors and outcomes with no physiological justification or hypothesis. Preprints, a version of a scientific paper that precedes formal peer review and publication, were rare in 2015 but are now increasingly mainstream. Since preprints are subject to light-touch quality control, or none at all, they are especially susceptible to AI-generated content. Richard Sever, the head of the preprint server *openRxiv* with over 7000 submissions per month, recently stated that his organisation turns away more than ten manuscripts per day with features of being AI-generated.[22]

Perverse incentives

The risk of research misconduct and suboptimal research conduct is increased in environments with perverse incentives. For example, in a study of predictors of misconduct, Fanelli *et al*[23] reported that in countries where publications are rewarded with cash incentives, the risk of problematic image duplication was higher for more productive, more frequently cited, earlier-career researchers working in lower-ranking institutions. In the UK, the Research Excellence Framework is a major driver of how researchers are judged by their institutions. It is therefore encouraging that the co-chair of the UK RIO said in 2024 that, "for future REF exercises, we'd be ahead of the global research assessment landscape if we make attention to research integrity explicit".[24] Judging which UK research institutions are providing an environment supportive of good research conduct has to be a sophisticated process. Such an environment requires a pro-active approach. The best institutions will be leading in research integrity innovation, such as auditing raw data of submitted manuscripts, compulsory data and metadata archiving and research integrity research.

Innovations in research integrity

Several groups have guided innovations in research integrity over the past decade. The World Conferences on Research

Integrity developed (1) the Singapore Statement on Research Integrity which focused on responsible practices and reporting misconduct, (2) the Cape Town Statement focussing on fostering research integrity through fairness and equity and (3) the Hong Kong principles which covered assessment of responsible research practices, valuing complete reporting, rewarding the practice of open science, acknowledging a broad range of research activities and recognition of essential other tasks such as peer review and mentoring.[25] The International Committee of Medical Journal Editors, whose completing interest disclosures form is well known to researchers, has published recommendations for the conduct, reporting, editing and publication of scholarly work in medical journals,[26] *The Lancet* launched its Commission on Research Integrity in 2025,[27] and since 2016, academic papers about research integrity have been published in *Research Integrity and Peer Review*. Other important resources include the International Association of Scientific, Technical & Medical (STM) Publishers' Integrity Hub that detects manuscripts found to 'violate accepted academic research integrity norms', serving as an 'early warning system' for integrity issues.[28] And to address the issue of guest editors of special issues working with paper mills (described above), STM with the Committee on Publication Ethics (COPE) has recently produced a guide on validating guest editors and auditing special issues at key stages of the editorial process.[29] Research integrity academics, such as Dr. Lex Bouter (Emeritus Professor, Vrije Universiteit Amsterdam), have also signposted how we can improve the research integrity milieu. At the institutional level, Bouter[30] recommends that researchers and support staff should be involved in designing and implementing research integrity policies and being a good reviewer (problems with data are often spotted by peer reviewers), supervisor, teacher, constructive team member and an effective communicator should be recognised and valued. He also recommends that funding agencies should develop research integrity promotion plans, and that journals should demand open methods and open data and use the most up-to-date methods for screening for plagiarism, image manipulation, statistical errors, use of AI and publish concerns or retract promptly. Some of these recommendations are already being put into practice. For example, the 2025 COPE retraction guidance now allows editors to retract a publication 'if they no longer have confidence in the results and conclusions reported in the paper',[31] that is, not to wait for the result of a drawn-out institutional investigation. In addition, COPE recommends that retraction notices should be published as soon as the editor is confident that the publication is seriously flawed or misleading, and if there is a delay in making this decision, editors should publish an expression of concern.

In conclusion, over the past decade, there have been many positive developments to support good research conduct, such as greater awareness among institutions of the need to have a supportive environment for research integrity and the development of research integrity as an academic area in its own right. The UK should be at the forefront of research integrity research and policies, but currently, it is unclear who in the UK is advocating nationally for resources to support improving research integrity environments. UK RIO is an obvious advocacy body but, remarkably, does not actively campaign for research integrity.[32] The Academy of Medical Royal Colleges and the NIHR should therefore take on this role. There are the emerging threats from AI, and from journals that prioritise profit over quality. Given these pressures, the importance of maintaining the integrity of the research process is even more important than before. Someone needs to pay for the time and expertise that allows academics to be confident in using published research. Indeed, the 'added value' provided by publishers, medical societies, editors and their peer reviewers forms an essential network that maintains research quality. We cannot permit dilution of the quality of the scientific literature, otherwise others will use this as an excuse to dismiss scientific evidence to the detriment of public health.

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REFERENCES

1 Grigg J. Good research conduct. *Arch Dis Child* 2005;90:229–32.
2 Callaway E. Pioneer behind controversial PubPeer site reveals his identity. *Nature Published Online First* 2015.
3 Evaristo J. Hard lessons. *Science* 2023;379:726.
4 PubPeer – Einstein foundation award. Available: https://award.einsteinfoundation.de/award-winners-finalists/recipients-2024/pubpeer [Accessed 5 Nov 2025].
5 PubPeer - search publications and join the conversation. Available: https://pubpeer.com/static/faq#5 [Accessed 5 Nov 2025].
6 Commenting on research items – researchgate. Available: https://help.researchgate.net/hc/en-us/articles/33255035546257-Commenting-on-research-items [Accessed 5 Nov 2025].
7 Caron MM, Lye CT, Bierer BE, *et al*. The PubPeer conundrum: Administrative challenges in research misconduct proceedings. *Account Res* 2025;32:1369–87.
8 NIHR open research | open access publishing platform | beyond a research journal. Available: https://openresearch.nihr.ac.uk/ [Accessed 5 Nov 2025].
9 Edinburgh datashare. Available: https://datashare.ed.ac.uk/ [Accessed 5 Nov 2025].
10 Embracing AI with integrity - UK research integrity office. Available: https://ukrio.org/ukrio-resources/embracing-ai-with-integrity/ [Accessed 15 Sep 2025].
11 AI guidelines. Available: https://www.wiley.com/en-us/publish/book/resources/ai-guidelines/ [Accessed 7 Nov 2025].
12 Quantifying and assessing the use of generative AI by authors and reviewers in the cancer research field - peer review congress. Available: https://peerreviewcongress.org/abstract/quantifying-and-assessing-the-use-of-generative-ai-by-authors-and-reviewers-in-the-cancer-research-field/ [Accessed 16 Sep 2025].
13 Extance A. AI-generated medical data can sidestep usual ethics review, universities say. *Nature New Biol* 2025;10.
14 Else H. Tortured phrases' give away fabricated research papers. *Nature New Biol* 2021;596:328–9.
15 Springer nature expands its portfolio of research integrity tools to detect non-standard phrases | springer nature group | springer nature. Available: https://group.springernature.com/gp/group/media/press-releases/non-standard-phrases-tool/27793146?UTM_medium=social&UTM_content=organic&UTM_source=X&UTM_campaign=SMT_%266592699481 [Accessed 15 Sep 2025].
16 Wachter S, Mittelstadt B, Russell C. Do large language models have a legal duty to tell the truth? *R Soc Open Sci* 2024;11:240197.
17 Paper mills research | COPE: committee on publication ethics. Available: https://publicationethics.org/guidance/research-and-reports/paper-mills-research [Accessed 15 Sep 2025].
18 Laine C, Babski D, Bachelet VC, *et al*. Predatory journals: what can we do to protect their prey? *The Lancet* 2025;405:362–4.
19 Zhuang H, Liang L, Acuna DE. Estimating the predictability of questionable open-access journals. *Sci Adv* 2025;11:eadt2792.
20 Richardson RAK, Hong SS, Byrne JA, *et al*. The entities enabling scientific fraud at scale are large, resilient, and growing rapidly. *Proc Natl Acad Sci U S A* 2025;122:e2420092122.
21 Suchak T, Aliu AE, Harrison C, *et al*. Explosion of formulaic research articles, including inappropriate study designs and false discoveries, based on the NHANES US national health database. *PLoS Biol* 2025;23:e3003152.
22 Watson T. AI content is tainting preprints: how moderators are fighting back. *Nature New Biol* 2025;644:590–1.

23 Fanelli D, Schleicher M, Fang FC, *et al*. Do individual and institutional predictors of misconduct vary by country? Results of a matched-control analysis of problematic image duplications. *PLoS ONE* 2022;17:e0255334.
24 Placing research integrity at the heart of REF - HEPI. Available: https://www.hepi.ac.uk/2024/05/07/placing-research-integrity-at-the-heart-of-ref/ [Accessed 16 Sep 2025].
25 The world conferences on research integrity - WCRIF - the world conferences on research integrity foundation. Available: https://www.wcrif.org/ [Accessed 15 Sep 2025].
26 ICMJE | recommendations | browse. Available: https://www.icmje.org/recommendations/browse/ [Accessed 15 Sep 2025].
27 Bouter L, Sham MH, Kleinert S. The Lancet-World Conferences on Research Integrity Foundation Commission on Research Integrity. *Lancet* 2025;406:896–7.
28 STM integrity hub - STM association. Available: https://stm-assoc.org/what-we-do/strategic-areas/research-integrity/integrity-hub/ [Accessed 22 Sep 2025].
29 Best practices for guest editors / issue validation and audit - STM association. Available: https://stm-assoc.org/document/guest-editors-issue-validation-and-audit/ [Accessed 22 Sep 2025].
30 Bouter L. Why research integrity matters and how it can be improved. *Account Res* 2024;31:1277–86.
31 COPE Council. COPE retraction guidelines. 2025. Available: https://doi.org/10.24318/cope.2019.1.4 [Accessed 7 Nov 2025].
32 Trends in UK research integrity – a decade of change? - UK research integrity office. Available: https://ukrio.org/news/trends-in-uk-research-integrity-a-decade-of-change/ [Accessed 16 Sep 2025].