Research result reporting set for boost under new system

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A new guideline for reporting research results has been developed to improve reproducibility, replication, and transparency in life sciences.

The new Research Materials, Design, Analysis and Reporting (MDAR) Framework will harmonize the recording of outcomes across several major journals, its developers say.

Existing guidelines address specific parts of biomedical research, such as ARRIVE—which relates to animal research—and CONSORT, associated with clinical trial reporting.

The MDAR Framework—developed by a team from the University of Edinburgh, the Centre for Open Science and six major journal publishers—complements these by establishing basic minimum reporting requirements and best practice recommendations.

The Framework is outlined in a new publication in the *Proceedings of National Academy of Sciences*.

Experimentation with various guidelines has resulted in a fragmented landscape, which, even though it has improved reporting, has increased the burden on authors' and editors' time.

According to the team, the flexibility of the Framework provides an opportunity for harmonization across journal publishing, making it easier for authors to know what is expected when submitting a manuscript and improve portability between journals.

This flexibility will also make it simpler for publishers to adopt. They will be able to select sections of the Framework that are most appropriate to the scope of specific journals.

The Framework includes an optional checklist for authors, editors or reviewers and explanatory documents to aid implementation.

The checklist was piloted on 289 manuscripts submitted to 13 different

journals. Feedback from authors, editors and external experts was then used to improve the Framework.

The team hope that the Framework will also be helpful for other organizations, such as funders who can indicate reporting expectations to their grantees when studies are first designed.

Professor Malcolm Macleod, Academic Lead for Research Improvement and Research Integrity, University of Edinburgh, said, "Improving research is challenging—it requires ongoing effort, adapting to the changing demands and circumstances of the time. No single intervention will be sufficient, but we hope that the MDAR framework can contribute to the range of initiatives which support improvement."

The six publishers that worked on the Framework include Science/AAAS, eLife, Cell/Elsevier, PLOS, Springer Nature and Wiley.

The full set of MDAR resources is available in a Collection on the Open Science Framework. It will be maintained and updated as a community resource.

Veronique Kiermer, Chief Scientific Officer at *PLOS*, said, "As more journals adopt similar reporting guidelines, they collectively raise the bar and make it easier for authors to know what's expected. In time, as research and reporting practices change, we hope that journals will continue to evolve their guidance to authors, moving from minimum requirement towards best practice."

Sowmya Swaminathan, Head of Editorial Policy and Research Integrity, Nature Portfolio, Springer Nature, said, "Through my work across multiple journals, I have learned that improving publication quality is a complex task, with each journal presenting its own set of challenges. The MDAR framework can be applied broadly and flexibly so that journals

can choose a level of implementation appropriate to their needs. The MDAR framework can be applied broadly and flexibly so that journals can choose a level of implementation appropriate to their needs."

David Mellor, Director of Policy from the Center for Open Science, said, "This framework will add clarity for researchers, readers, and journals in order to lower barriers to replicating empirical findings. We at COS are happy to steward MDAR so that it can remain a viable practice for the foreseeable future."

More information: Malcolm Macleod et al. The MDAR (Materials Design Analysis Reporting) Framework for transparent reporting in the life sciences, *Proceedings of the National Academy of Sciences* (2021). DOI: 10.1073/pnas.2103238118

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