Open data/software: The journal perspective

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Managing Editor, Science, AAAS
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Open data standards and journal responsibility

**FAIR principles**
Findability, Accessibility, Interoperability, Reusability

**TOP guidelines**
Transparency and Openness Promotion

**MIBBI guidelines**
Minimum Information for Biological and Biomedical Investigations

**And more!**

“Transparency, openness, and reproducibility are readily recognized as vital features of science”

https://www.science.org/doi/10.1126/science.aab2374
More on TOP guidelines

<table>
<thead>
<tr>
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<th>LEVEL 0</th>
<th>LEVEL 1</th>
<th>LEVEL 2</th>
<th>LEVEL 3</th>
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<tbody>
<tr>
<td><strong>Citation standards</strong></td>
<td>Journal encourages citation of data, code, and materials—or says nothing.</td>
<td>Journal describes citation of data in guidelines to authors with clear rules and examples.</td>
<td>Article provides appropriate citation for data and materials used, consistent with journal’s author guidelines.</td>
<td>Article is not published until appropriate citation for data and materials is provided that follows journal’s author guidelines.</td>
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<tr>
<td><strong>Data transparency</strong></td>
<td>Journal encourages data sharing—or says nothing.</td>
<td>Article states whether data are available and, if so, where to access them.</td>
<td>Data must be posted to a trusted repository. Exceptions must be identified at article submission.</td>
<td>Data must be posted to a trusted repository, and reported analyses will be reproduced independently before publication.</td>
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<td><strong>Analytic methods (code) transparency</strong></td>
<td>Journal encourages code sharing—or says nothing.</td>
<td>Article states whether code is available and, if so, where to access them.</td>
<td>Code must be posted to a trusted repository. Exceptions must be identified at article submission.</td>
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Not all repositories are created equal

Content
Many are field-specific or otherwise specialized, but what if a dataset spans multiple disciplines?

Policy
What about retention policies and their effect on reproducibility?

Uncertainty
How do authors discern which is the best fit?
Benefits to collaboration

- Quality control
- Machine readability
- Metadata richness and consistency
- Permanent access
- Attribution
- Facilitating peer review
Action within the *Science* family

**Policy**
Data and code must be publicly available and cited with a persistent identifier

**Partnership**
New collaboration with Dryad

**Integration**
Authors may deposit data at Dryad directly from the submission site of any *Science* family journal
Action within the *Science* family

**Added value**
Seamless, private access for editors and reviewers; data curation

**Enhanced equity**
No cost to authors of accepted papers

**Other benefits**
Simplify process for authors; promote reproducibility; encourage collaboration

“Ensuring the accuracy of the scientific record is a community process”

https://www.science.org/doi/10.1126/science.adl0333
Moving from principles to daily practice

Author-provided citation
5. DOI: 10.12345/ABC000999

Full citation after copyediting
5. A. Author, B. Author, C. Author, Example software title, version 2, Example Repository Name (2022); DOI: 10.12345/ABC000999.

Citation in XML
<ref id="R5"><label>5</label><mixed-citation publication-type="software"><person-group person-group-type="author"><string-name><given-names>A.</given-names> <surname>Author</surname></string-name>, <string-name><given-names>B.</given-names> <surname>Author</surname>, <string-name><given-names>C.</given-names> <surname>Author</surname></string-name></person-group>, <part-title>Example software title</part-title>, <version>version 2</version>, <source>Example Repository Name</source> (year=2022); <pub-id pub-id-type="doi">10.12345/ABC000999</pub-id>.</mixed-citation></ref>
Moving from principles to daily practice

Better citations → more credit → reuse!

A working group devoted to optimizing the reusability of scholarly content by developing best-practice recommendations for tagging in JATS XML

https://jats4r.org/
Thank you!

Email: lkmec@aaas.org
LinkedIn: https://www.linkedin.com/in/lauren-kmec-96a99729
Science: https://www.science.org/journal/science