

Development History Analysis and Implications of Research Data Deposition for Scientific Journal Articles: Postprint

Authors: Lei Xue, Chen Xuwen, Yao Changqing

Date: 2024-10-06T00:00:00+00:00

Abstract

Objective: The submission of research data associated with scientific journal papers is a crucial prerequisite for promoting the openness, sharing, and reuse of scientific data. Analyzing the developmental trajectory of research data submission helps clarify the current stage and deficiencies of submission practices in China, thereby enabling optimization and improvement. **Method:** Through web-based investigation and comparative analysis, this study systematically reviews the developmental stages, landmark events, and evolutionary pathways of international research data submission associated with papers, and analyzes the core participating entities and their primary responsibilities. **Results:** The developmental history can be divided into three stages: data archiving, data publishing, and data quality control. In this ecosystem, data repositories provide infrastructure support, publishing institutions implement submission standards and procedures, funding agencies support and facilitate multi-stakeholder collaboration, government departments control macro-level policy direction, and researchers execute specific tasks and provide feedback. **Conclusion:** Compared with international developments, China needs to strengthen collaborative relationships between data repositories and scientific journals, improve the evaluation mechanism for scientific and technological achievements, attend to the needs and feedback of researchers, and enhance scientific data quality control, in order to advance the submission of research data associated with scientific journal papers in China.

Full Text

Analysis and Enlightenment on the Development Process of Paper-Related Data Submission in Scientific Journals

LEI Xue¹, CHEN Xuwen¹, YAO Changqing^{1,*}

¹Institute of Scientific and Technical Information of China, No. 15 Fuxing Road, Haidian District, Beijing 100038, China

Abstract

[Purposes] Paper-related data submission in scientific journals represents a critical prerequisite for advancing the open sharing and reuse of research data. Analyzing the developmental trajectory of paper-related data submission helps clarify China's current stage and existing deficiencies, thereby enabling optimization and improvement.

[Methods] Through web-based investigation and comparative analysis, this study systematically reviews the developmental stages, landmark events, and evolutionary pathways of international paper-related data submission, while analyzing the core participants and their primary responsibilities.

[Findings] The evolutionary process can be divided into three distinct stages: data archiving, data publishing, and data quality control. In this ecosystem, data repositories provide infrastructure support, publishers implement submission standards and procedures, funding agencies facilitate multi-stakeholder collaboration, government departments establish macro-level policy direction, and researchers execute the actual submission while providing feedback.

[Conclusions] Compared with international developments, China needs to strengthen collaboration between data repositories and scientific journals, improve evaluation mechanisms for scientific achievements, address researcher needs and feedback, and enhance scientific data quality control to advance the nation's paper-related data submission efforts.

Keywords: scientific journals; paper-related data; data submission; developmental process

Paper-related data in scientific journals constitutes an essential component of scientific data and serves as the core supporting element for research conclusions. In recent years, China has attached great importance to paper-related data submission work. In March 2018, the General Office of the State Council issued the *Administrative Measures for Scientific Data* [?], which stipulated that competent authorities and legal entities should actively promote the publication and dissemination of scientific data, supporting researchers in organizing and publishing scientific data with clear property rights, complete accuracy, and high sharing value. In November 2022, the China Association for Science and Technology and the Chinese Academy of Sciences jointly launched a paper-related data submission initiative, releasing the *Notice on Organizing Paper-Related Data Submission Work for Journal Articles* [?] (hereinafter referred to as the *Notice*), which encourages researchers to submit paper-related data to the "Sci-Tech Innovation China" scientific data repository and application service platform.

However, practical implementation remains limited. Among the 199 “tiered journals” under China’s Excellence Action Plan for Scientific Journals, only 34.67% have established data submission policies [?]. As of August 2024, Chinese repositories account for merely 5% of those indexed in re3data, indicating that further advancement is needed.

Current research on paper-related data submission in China focuses on submission methods and value, data policies, data storage and openness, and metadata standards. For instance, Wang and Liu [?] explored and assessed the research and socioeconomic value of scientific data. Kong et al. [?] proposed a general data policy framework for Chinese scientific journals based on FAIR principles. Jiang et al. [?] analyzed international scientific data repository platforms to inform domestic platform development. Gao et al. [?] developed metadata standards for data paper publication by extracting publication elements from data papers and associated scientific datasets. Notably absent, however, is a comprehensive chronological analysis of the overall system development for paper-related data submission.

Understanding and analyzing the developmental pathways of mature international paper-related data submission systems can illuminate the core construction entities, collaborative operational mechanisms, and key advancement measures. Therefore, this study focuses on the developmental history of international paper-related data submission, clarifies the evolutionary trajectory of inter-institutional collaboration and mutual development, and compares it with China’s current status and deficiencies to provide insights for advancing domestic efforts.

1. Definition of Key Concepts

Scientific data primarily encompasses data generated through basic research, applied research, and experimental development in natural sciences, engineering, and technical fields, as well as original and derived data obtained through observation, monitoring, investigation, and testing for scientific research activities [?]. Paper-related data represents an important form of scientific data—specifically, the non-sensitive, non-confidential original and derived data generated during research that supports the charts and conclusions of academic papers submitted to domestic and international scientific journals, yet is unsuitable for inclusion in the paper itself [?]. Paper-related data submission refers to the process of submitting such data to designated data repositories.

Compared with other types of scientific data such as project data or industry data, paper-related data is closely tied to scientific journals and can enhance the rigor of peer review, ensure research authenticity, improve research transparency, support research integrity, and promote open science principles. It advances the open sharing and reuse of scientific data, thereby improving research efficiency and impact.

2. Developmental Stages of Paper-Related Data Submission

With advances in computer technology, the volume of data resources in scientific research has grown rapidly, making paper-based record-keeping inadequate. Since the 1970s, the academic community has established data repositories and archives to store paper-related data, proposing the concept of “scientific data archiving” and exploring the value of paper-related data and its submission systems.

Stage 1: Data Archiving (1970s-2000s)

Initial establishment of data archives. During this phase, some research institutions began establishing small-scale data archives to consciously preserve data, initially storing domain-specific scientific data before gradually expanding to large-scale, multidisciplinary storage infrastructure. In the social sciences, the Council of European Social Science Data Archives (CESSDA) was established in 1976 to archive research data obtained by European public opinion research organizations, while the Oxford Text Archive (OTA) was founded the same year to primarily archive electronic document-type textual data in historical studies. In natural sciences, the Protein Data Bank (PDB) was established in 1971 through a partnership between the Cambridge Crystallographic Data Centre (CCDC) and Brookhaven National Laboratory (BNL) to archive protein crystal structure data.

Archiving and linking of paper-related data. Displaying only partial data within paper texts proved insufficient for presenting complete scientific experimental processes. The academic community began archiving paper-related data and linking it to papers to ensure the integrity of journal publications. Regarding archival policies, publishers gradually recognized the role of data archiving in preserving research integrity and began discussing implementation. The American Geophysical Union (AGU) adopted its first data archiving policy in 1993 [?], allowing authors to create “data files” for journal submission. For data linking, academics experimented with using URL technology to reference data in paper annotations, enabling associations between publications and research datasets. For example, since 1995, the Astrophysics Data System has provided links from publications to relevant datasets, allowing direct access to paper-related data.

Initial recognition of paper-related data value. Data gradually became a core element of new publishing models. In 2001, the U.S. National Academy of Sciences (NAS) discussed and clarified the responsibilities of life sciences authors to share data and materials cited in their publications [?]. In 2003, the *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities* included data supporting scientific research as objects of open access, emphasizing the value of scientific data in ensuring research authenticity. In publishing practice, CODATA’s 2002 recommendations [?] suggested that journal publishers experiment with online preprint publication or journal supplements to

ensure paper-related data submission. In 2007, the publishing industry jointly released the *Brussels Declaration* [?], articulating innovation principles in electronic scholarly publishing and emphasizing that readers should have access to the original scientific data used in papers.

Exploration of scientific data open utilization pathways. As scientific data's importance grew, institutions recognized the central role of paper-related data submission in open reuse efforts and independently explored mechanisms and infrastructure. For example, Creative Commons began building a Science Commons community in 2005 from a copyright perspective to address data copyright issues in scientific research [?]. In 2006, the Organization for Economic Co-operation and Development (OECD) issued the *21st Century Science, Technology and Innovation Communique* [?], calling for open sharing of all publicly funded scientific data. The European Strategy Forum on Research Infrastructures (ESFRI) published a roadmap for new large-scale European research infrastructure in 2006, establishing 35 major infrastructure projects across seven domains to ensure data resource creation, archiving, and dissemination.

Stage 2: Data Publishing (2009-2015)

As scientific research transformed into data-intensive science, scientific data became a crucial research output. In 2009, DataCite began assigning DOIs to scientific data as independent publications, marking the start of this stage. Data publishing encompasses both supplementary data publication and data paper publication. Publishers began storing data as independent content, while multiple institutions collaborated to establish large-scale data repositories and professional data management organizations to improve submission workflows.

Emergence of data publishing models. Archives and other repositories merely archived paper-related data without ensuring eventual public sharing. Data publishing models allowed researchers to further describe their data and provided new approaches for open access. Data papers describe data collection methods, usage instructions, and dataset links in the text, while hosting original datasets in appropriate repositories for open sharing through those platforms. In 2012, the UK's Natural Environment Research Council (NERC) identified data paper publication as an important data sharing method. In practice, Copernicus launched the pure data journal *Earth System Science Data* in 2009, followed by mainstream publishers such as Elsevier and Nature, which launched *Data in Brief* and *Scientific Data* respectively in 2014.

Multi-institutional establishment of large public repositories. The large scale and variable types of paper-related scientific data increased storage management challenges, necessitating specialized institutions. During this stage, domain-specific institutions collaborated to establish comprehensive, large-scale public repositories to store different data types and enable open sharing. For example, the Dryad public repository was co-founded by the National Evolutionary Synthesis Center (NESCent) and the NSF. In 2013, PLoS announced a part-

nership with Springer subsidiary to jointly manage the open public repository Figshare. Additionally, the academic community innovated existing archives; in 2013, the European Commission developed the general-purpose repository Zenodo based on the previous OpenAIREplus project, in partnership with CERN [?].

Deep collaboration between repositories and publishers. The establishment of public repositories enabled entrusted management of paper-related data, helping publishers address post-submission management costs. Regarding collaborative policies, journals and societies jointly launched the Joint Data Archiving Policy (JDAP) in 2011 [?], stating that archiving data supporting paper results in appropriate public repositories should be a publication condition and recommending Dryad as a primary storage platform. To strengthen linking, Elsevier launched a data-article linking initiative in 2013, actively seeking to establish links between online academic papers and databases. The publisher has since partnered with over thirty data repositories and continues seeking additional collaborations to increase the visibility and usage of scientific papers and their associated data.

Multi-institutional coordination to improve submission workflows. During this stage, institutions collaboratively established data management organizations for process management and innovated technologies to promote open sharing. Technologically, the French National Center for Scientific Research's Institute for Scientific and Technical Information, the Danish Technical Information Center, and other institutions established DataCite in 2009 to assign DOIs to scientific data as independent publications, addressing URL longevity issues and providing integrated services. For submission management, international organizations such as the Research Data Alliance (RDA) and re3data were established, uniting repository institutions within their systems to collaboratively advance submission system improvements.

Stage 3: Data Quality Control (2015-Present)

In 2015, the Center for Open Science (COS) launched the TOP Guidelines to measure data quality through openness and transparency, marking the academic community's initial attempt to establish a quality evaluation system for paper-related data. The community gradually developed authoritative data quality standards and security management measures, while practically strengthening quality management through relevant technologies and improved peer review systems.

Gradual formulation of data quality assessment standards. Single-dimensional "usability" criteria proved insufficient for researchers' reuse needs. International organizations facilitated multi-institutional discussions to develop paper-related data quality standards from different perspectives and purposes. In 2015, COS released the *Transparency and Openness Promotion (TOP) Guidelines* [?], providing journal policy-makers with a hierarchical framework to im-

prove scientific reporting and establishing requirements for data reliability and reproducibility. In 2016, stakeholders representing researchers, funding agencies, and publishers collectively developed the “Findable, Accessible, Interoperable, and Reusable” standards—known as the FAIR Principles [?]¹—which have become the authoritative guiding principles for scientific data quality.

Emphasis on copyright and security management. Researchers’ uncertainty about data ownership and concerns about misuse have hindered submission progress. To address these issues, organizations issued relevant policies to improve management processes. Regarding data copyright, FORCE11 and the Committee on Publication Ethics (COPE) jointly established the FORCE11 Research Data Publishing Ethics Working Group in 2021 to develop ethical recommendations for data publication and create operational flowcharts to help editors address potential issues. For data security management, the U.S. National Institutes of Health (NIH) released its Data Management and Sharing Policy on January 25, 2023 [?]², detailing six required elements for data management plans, including specifications for embargo periods and privacy data statements for project-generated paper-related data.

Progressive strengthening of quality control by repositories. As data management institutions, public repositories have implemented FAIR principles to ensure submission quality and subsequent data operability. Repositories primarily collaborate to ensure data compatibility; for example, Dryad and Zenodo cooperate to build researcher submission workflows ensuring data can run on multiple software platforms. Regarding metadata improvement, major general repositories such as Figshare, Dryad, and Mendeley Data have added domain-specific metadata fields and export ports to enhance data content description.

Advancement of data peer review by scientific journals. Data peer review serves as the primary mechanism for ensuring paper-related data quality, requiring publishers to issue detailed guidelines for standardized management. Unlike traditional paper peer review, data peer review faces challenges including dataset size, comprehension difficulties, and incomplete evaluation mechanisms. To address these issues and standardize management, PLoS released simplified data peer review guidelines in 2020 [?]³, encouraging reviewers to assess data quality across five dimensions, establishing a foundational framework. In practice, major publishers including Springer Nature, Elsevier, and Wiley have incorporated peer review requirements in their highest-level data policies, stating that authors must submit all data required by reviewers. Wiley further proposes that peer review may involve reproducibility verification to ensure claims in journal articles are valid and reproducible.

3. Analysis of Key Stakeholders in Paper-Related Data Submission

The international academic community has initially formed a multi-stakeholder collaborative system for paper-related data submission. In 2023, the Interna-

tional Association of Scientific, Technical and Medical Publishers (STM) released a joint statement on research data [?], briefly outlining the responsibilities of major stakeholders. Referencing the stakeholder types mentioned in this statement (as shown in Figure 1 [Figure 1: see original paper]) and analyzing the key initiatives across developmental stages, this study summarizes the primary responsibilities and interaction mechanisms of submission stakeholders.

Figure 1. Participation of Paper-Related Data Submission Stakeholders

Data repositories primarily provide data storage and management services to ensure smooth submission implementation. Repositories continuously optimize platform construction to enhance researcher experience. A joint tracking survey by Figshare and Springer Nature [?] revealed that over 40% of researchers highly value repository suitability during data submission. Given that limitations on total submittable data volume and types, long-term storage validity, and submission process complexity significantly affect researcher willingness, repositories must provide favorable submission environments by substantially increasing allowable dataset sizes and developing new API ports (e.g., Dryad' s REST API for rapid data export/import) to simplify workflows.

Additionally, repositories undertake data quality control to lay the foundation for open sharing. A 2022 re3data survey of indexed repositories [?] found that most consider their storage domains and data content quality when selecting submitted datasets. For quality assurance, repositories primarily ensure paper-related data quality through two approaches: organizing independent data reviews or requiring submitters to undergo review via data journal publication. Simultaneously, most repositories implement quality control measures to comply with FAIR principles, such as linking submitted data to existing research to enhance discoverability and developing services related to stored data types (e.g., GitHub' s automatic code compilation) to improve reusability.

Publishers primarily formulate relevant standards to drive submission practices. Overly strict data policies severely impact author willingness and ultimately affect submission effectiveness. Journals and publishers must develop appropriate policies based on their actual circumstances. The RDA began collecting feedback and requirements on journal and publisher data policies at its 2017 plenary, continuously revising them through input from editors, publishers, and researchers, ultimately releasing the *Research Data Policy Framework for Journals and Publishers* in 2020 [?] to guide business practices (see Table 1).

Table 1. Framework for Journal and Publisher Research Data Policy Levels

Policy Element	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Paper-related data definition						
Data licensing agreement						
Data embargo period						
Recommended repositories						
Privacy data statement						
Data availability statement						
Open access for specific data types						
Open access for all data types						
Data peer review						
Data standards and formats						

Note: indicates the journal only needs to establish the policy; indicates the journal must require authors to implement the policy.

As shown in Table 1, these six levels allow different journals to implement policies progressively according to their circumstances. Levels 1 and 2 require journals to establish basic data sharing policies, only mandating attribution for paper-related data. Level 3 requires journals to mandate data availability statements without detailed content review or enforcement. Level 4 requires journals to enforce all repository-specified requirements, including supplementary material submission and embargo periods. Level 5 mandates data sharing without requiring regular peer review, while Level 6 makes data peer review and strict data standards a key feature.

In policy practice, mainstream academic publishers such as Springer Nature and Wiley have developed multi-level data management policies for their journals, requiring selection and compliance while gradually strengthening submission requirements. For example, Springer Nature initially categorized policy inten-

sity into four levels, escalating from encouraging data citation to mandatory sharing, allowing journals to choose independently, with most starting from encouraging policies. Currently, Springer Nature requires all its journals to adopt stronger submission policies, mandating data availability statements and compulsory submission of ten types of paper-related data, including DNA sequence data.

Funding agencies, as core financial providers, support the development of standards and problem-solving through joint discussions, as evaluation criteria and regulatory issues for paper-related data cannot be established by single entities. With support from funding agencies—including government bodies (NSF, NASA) and private foundations (Robert Wood Johnson Foundation)—COS developed the TOP Guidelines to provide quality control standards for paper-related data and created the Open Science Framework (OSF) to offer integrated data management platforms for research institutions, reducing management redundancy and service costs.

Furthermore, funding agencies can guide researcher submission through policy adjustments. They can cultivate awareness of data management and submission by requiring data management plans and allocating dedicated funding. Regarding data rights, since researcher concerns largely stem from uncertainty about data ownership in funded projects, studies suggest that funding agencies can guide submission by clarifying data copyright [?].

Government departments, as macro-level policy makers, guide system construction and provide legal safeguards. For example, the U.S. National Science and Technology Council (NSTC) established a Scientific Integrity Working Group in 2021 to incorporate integrity elements into data submission management. In 2022, the UK government issued *User Research and the General Data Protection Regulation* [?], defining researcher data as personal data at the national level to address privacy concerns.

Moreover, government policies significantly drive submission efforts. National strategic roadmaps deploy relevant plans to promote policy implementation. The U.S. White House Office of Science and Technology Policy (OSTP) mandated in its 2022 open access memorandum that all federally funded research outputs (publications and project data) be immediately and freely available to the public, requiring full implementation by the end of 2025. It subsequently declared 2023 the Year of Open Science [?], promoting the formation of NIH data sharing policies and USDA data standardization mechanisms. In 2023, the UK government listed paper-related data submission as an element of a healthy research system in its R&D roadmap [?].

Researchers, as submission executors, provide critical feedback through long-term tracking of their willingness. Throughout the developmental process, government departments and international organizations have closely monitored researcher behavior. For example, the EU's 2010 PARSE.Insight project [?] found that over half of respondents had high quality requirements for submitted

data, prompting subsequent development of data quality principles. A UK government report [?] identified complex scientific data authorization procedures as a major concern that reduces submission willingness.

Additionally, objective data on submission volume and availability reflect system development status, providing references for improvement. For instance, Tedersoo et al. [?] analyzed papers across nine disciplines in *Nature* and *Science* to assess current data availability, conducting follow-up surveys with corresponding authors of unavailable data to summarize failure causes and provide recommendations for policy development.

4. Implications for China's Paper-Related Data Submission Work

China's paper-related data submission currently sits between improving data publishing and advancing toward quality control—stakeholder construction continues, but with a later start than Europe and the U.S., underdeveloped stakeholder roles, and insufficiently deep collaboration.

Infrastructure and policies: While data repository construction has advanced significantly, few platforms receive international journal recognition. China has established 20 national scientific data centers, but only 11—including the National Earth System Science Data Center and National Population Health Science Data Center—are internationally recognized and support paper-related data submission. Policy-wise, the 2022 *Notice* clarified cooperative submission forms between Science DB and publishers, but progress has been slow. As of August 2024, the CAST Science DB Community—China's scientific data repository and application service platform—stores only 996 paper-related data submissions from 29 journals [?], indicating inadequate cooperation between journals and repositories.

Conceptual guidance: China has begun emphasizing researcher experience, with repositories optimizing services to improve submission willingness. For example, the Institute of Hydrobiology, Chinese Academy of Sciences has built a visualization and service system for aquatic biological scientific data to facilitate reuse. However, funding agencies and government departments have yet to issue policies recognizing the value of scientific data. China's scientific achievement evaluation mechanism, which currently focuses on literature and patent contributions, lacks evaluation of scientific data value, resulting in insufficient researcher appreciation and low submission enthusiasm.

Quality control: While some disciplines have practical foundations—for instance, the National Tibetan Plateau Data Center has established dual review mechanisms combining format review and peer review—China has not yet issued comprehensive scientific data quality evaluation standards. Currently, only the ISO 8000 series standards measure general data quality without specific application to scientific data, leaving publishers and repositories still exploring quality control approaches.

Advancing China's paper-related data submission requires not only national policy support but also learning from international collaborative mechanisms and key measures. Improvements should focus on:

(1) Strengthening repository-journal collaboration to improve submission mechanisms. Repositories should develop submission standards based on FAIR principles and provide data security and rights protection mechanisms. Journals should be encouraged to collaborate with certified repositories according to policy templates. Additionally, domain-specific repositories should be developed to establish discipline-tailored standards and provide targeted services for field-specific paper-related data.

(2) Improving scientific achievement evaluation to transform submission concepts. In March 2020, the Ministry of Science and Technology issued measures to combat the "paper-only" orientation in evaluation [?], calling for attention to genuine research outcomes. Incorporating scientific data value recognition and sharing behavior into talent evaluation systems would enable more accurate assessment of contributions and transform researcher attitudes. Funding agencies could also guide submission by establishing data management plans and allocating dedicated project funds for paper-related data submission.

(3) Addressing researcher needs and feedback to foster a sharing culture. Researchers' submission willingness is influenced by their scientific community's sharing environment. Surveys should clarify needs across different fields and disciplines to build targeted data communities and popularize sharing concepts. Additionally, hierarchical, gradient-based data literacy training should be provided based on actual submission conditions and researcher needs.

(4) Learning from international best practices to advance quality control. Chinese standardization bodies such as the National Information and Documentation Standardization Technical Committee should track international standards and develop scientific data evaluation standards adapted to domestic practice. Repositories could employ emerging technologies like artificial intelligence to assist data review, while publishers could improve data peer review systems, such as introducing third-party open peer review, to ensure paper-related data quality.

5. Conclusion

Scientific data has become a key focus of open science efforts, holding equal importance to scientific literature. Advancing paper-related data submission is essential for promoting scientific data openness, sharing, and reuse. This study systematically reviews the developmental stages of international paper-related data submission, clarifies the primary participants and their responsibilities, and analyzes China's current status and deficiencies to provide references for future work. As paper-related data characteristics vary across disciplines, submission priorities and challenges differ accordingly, warranting further domain-specific research.

Funding: National Social Science Foundation General Project “Research on Paper-Related Data Submission Models for Scientific Journals from an Open Science Perspective” (Grant No. 22BTQ107)

Author Contributions: - LEI Xue: Designed the research framework, wrote and revised the paper - CHEN Xuwen: Collected and organized materials, wrote the initial draft - YAO Changqing: Proposed research direction and concepts, finalized the paper

Corresponding author: YAO Changqing (ORCID: 0000-0003-2928-1507), Ph.D., Professor, yaocq@istic.ac.cn

References

- [?] General Office of the State Council. Notice on Issuing the Administrative Measures for Scientific Data [EB/OL]. [2023-09-23]. https://www.gov.cn/gongbao/content/2018/content_{528}
- [?] General Office of China Association for Science and Technology & General Office of Chinese Academy of Sciences. Notice on Organizing Paper-Related Data Submission Work for Journal Articles [EB/OL]. [2023-09-26]. <https://stm.castscs.org.cn/cj/39919.jhtml>
- [?] Kong Lihua, Chen Shushu, Xi Yan, et al. Investigation and Analysis of Data Policy Implementation Status of Journals Selected for China’s Excellence Action Plan for Scientific Journals [J]. China Scientific Data (Chinese-English Online Edition), 2023, 8(1): 224-234.
- [?] Wang Dandan, Liu Yaning. Scientific Data Value: Research Review and Prospects [J]. Library and Information Service, 2023, 67(09): 141-150.
- [?] Kong Lihua, Xi Yan, Jiang Lulu. Research on Open Sharing and Publication Policies for Journal-Related Data [J]. Chinese Journal of Scientific and Technical Periodicals, 2022, 33(2): 192-199.
- [?] Jiang Lulu, Zhang Zeyu, Li Zongwen, et al. Current Status and Prospects of Global Scientific Data Repository Platform Construction [J]. China Scientific Data (Chinese-English Online Edition), 2023, 8(1): 175-195.
- [?] Gao Yuwei, Zhu Yanhua, Kong Lihua, et al. Research on Metadata Standards for Data Papers and Associated Scientific Datasets [J]. Chinese Journal of Scientific and Technical Periodicals, 2023, 34(10): 1270-1282.
- [?] Hanson B. AGU’s data policy: History and context [J]. Transactions American Geophysical Union, 2014, 95(37): 337-337.
- [?] Cech T R, Eddy S R, Eisenberg D, et al. Sharing publication-related data and materials: responsibilities of authorship in the life sciences [J]. Plant Physiology, 2003, 132(1): 19-24.

[?] CECH T R, EDDY S R, EISENBERG D, et al. Sharing publication-related data and materials: responsibilities of authorship in the life sciences [J]. *Plant Physiology*, 2003, 132(1): 19-24.

[?] BRUSSELS DECLARATION ON STM PUBLISHING [EB/OL]. [2024-03-04]. https://www.stm-assoc.org/2007_{{11}}{{01}}{{Brussels}}_{{Declaration}}.pdf

[?] About Science Commons [EB/OL]. [2024-03-04]. <https://web.archive.org/web/20091124233710/http://scier>

[?] Klump J, Bertelmann R, Brase J, et al. Data publication in the open access initiative [J]. *Data Science Journal*, 2006, 5: 79-83.

[?] CERN and OpenAIREplus launch European research repository [EB/OL]. [2024-08-04]. [https://home.web.cern.ch/news/computing/cern-and-openaireplus-launch-european-repository](https://home.web.cern.ch/news/computing/cern-and-openaireplus-launch-european-research-repository)

[?] Joint Data Archiving Policy [EB/OL]. [2024-04-02]. <https://datadryad.org/docs/JointDataArchivingPolicy>.

[?] Transparency and Openness Promotion (TOP) Guidelines [EB/OL]. [2024-04-21]. <https://osf.io/9f6gx/>

[?] Wilkinson M D, Dumontier M, Aalbersberg I J J, et al. The FAIR Guiding Principles for scientific data management and stewardship [J]. *Scientific data*, 2016, 3(1): 1-9.

[?] 2023 NIH Data Management and Sharing Policy [EB/OL]. [2024-04-02]. <https://oir.nih.gov/sourcebook/intramural-program-oversight/intramural-data-sharing/2023-nih-data-management-sharing-policy>

[?] PEER REVIEWING DATA [EB/OL]. [2023-09-23] <https://plos.org/wp-content/uploads/2020/05/PeerReviewingDatasets.pdf>

[?] Joint Statement on Research Data [EB/OL]. [2024-03-04]. <https://www.stm-assoc.org/research-data-program/bestpractices/>

[?] SCIENCE D, HAHNEL M, SMITH G, et al. The state of open data 2023 [R/OL]. [2024-05-20]. https://digitalscience.figshare.com/articles/report/The_{{State}}{{of}}{{Open}}

[?] Kindling M, Strecker D. Data quality assurance at research data repositories [J]. *Data Science Journal*, 2022, 21: 18-18.

[?] Hrynaskiewicz I, Simons N, Hussain A, et al. Correction: ' Developing a Research Data Policy Framework for All Journals and Publishers [J]. *Data Science Journal*, 2020, 19(1).

[?] Harnad S. Open Access to Research. Changing Researcher Behavior Through University and Funder Mandates [J]. *JeDEM-eJournal of eDemocracy and Open Government*, 2011, 3(1): 33-41.

[?] Managing user research data and participant privacy [EB/OL]. [2024-04-02]. <https://www.gov.uk/service-manual/user-research/managing-user-research-data-participant-privacy#protecting-privacy-when-sharing-research-outputs>

[?] THE WHITE HOUSE. FACT SHEET: Biden-Harris Administration Announces New Actions to Advance Open and Equitable Research [EB/OL]. [2024-04-02]. <https://www.whitehouse.gov/ostp/news-updates/2023/01/11/fact-sheet-biden-harris-administration-announces-new-actions-to-advance-open-and-equitable-research/>

[?] UK Research and Development Roadmap (webpage) [EB/OL]. [2024-04-02]. <https://www.gov.uk/government/publications/uk-research-and-development-roadmap/uk-research-and-development-roadmap>

[?] Insight into digital preservation of research output in Europe [EB/OL]. [2023-10-18]. http://web.archive.org/web/20150224034521/http://www.parse-insight.eu/downloads/PARSE-Insight_{D3}-6_{InsightReport}.pdf

[?] Tedersoo L, Küngas R, Oras E, et al. Data sharing practices and data availability upon request differ across scientific disciplines [J]. *Scientific data*, 2021, 8(1): 192.

[?] China Association for Science and Technology Scientific Data Repository and Application Service Platform [EB/OL]. [2024-08-11]. <https://cast.scidb.cn/en>

[?] Resolutely Eliminate the “Paper-Only” Orientation and Accelerate the Improvement of the Science and Technology Evaluation System—Interpretation by Relevant Department Heads of the Ministry of Science and Technology on “Several Measures for Eliminating the ‘Paper-Only’ Orientation in Science and Technology Evaluation (Trial)” [EB/OL]. [2023-07-18]. https://www.most.gov.cn/xxgk/xinxifenlei/fdzdgknr/fgzc/zcjd/202007/t20200724_{158013}.html

Note: Figure translations are in progress. See original paper for figures.

Source: ChinaXiv –Machine translation. Verify with original.