

Unlocking knowledge: The power of data sharing in modern scientific research

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Unlocking Knowledge: The Power of Data Sharing in Modern Scientific Research

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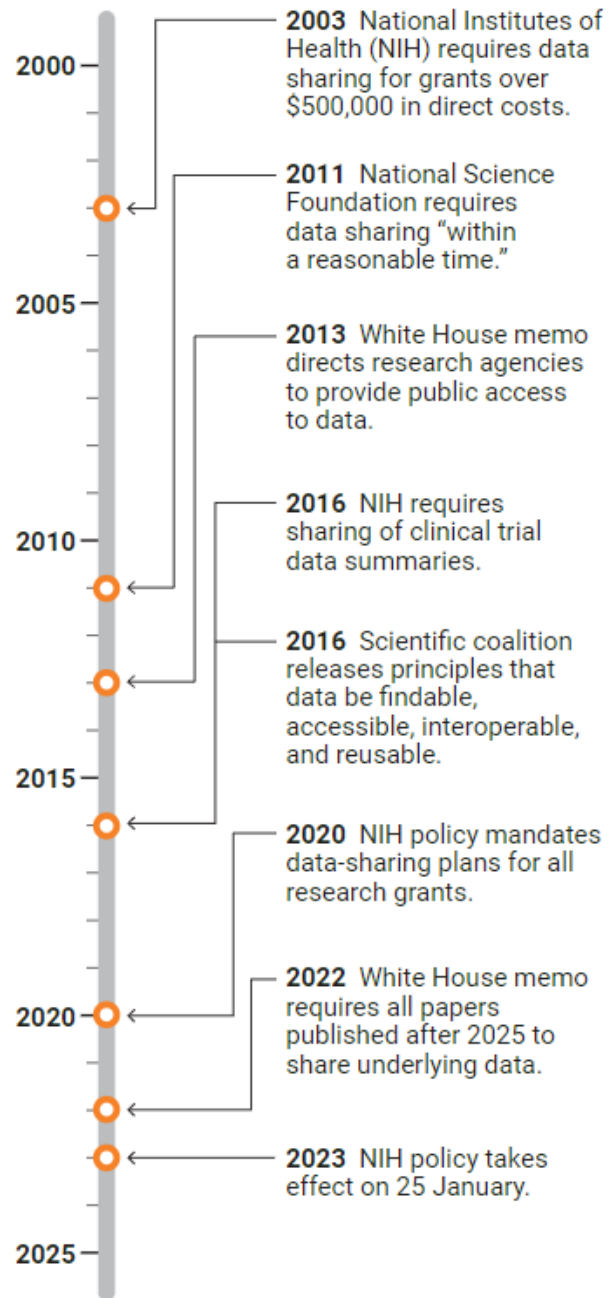


Introduction

- Brief history of data sharing
- Importance in the modern era
- Presentation objective



Major U.S. policies for data sharing



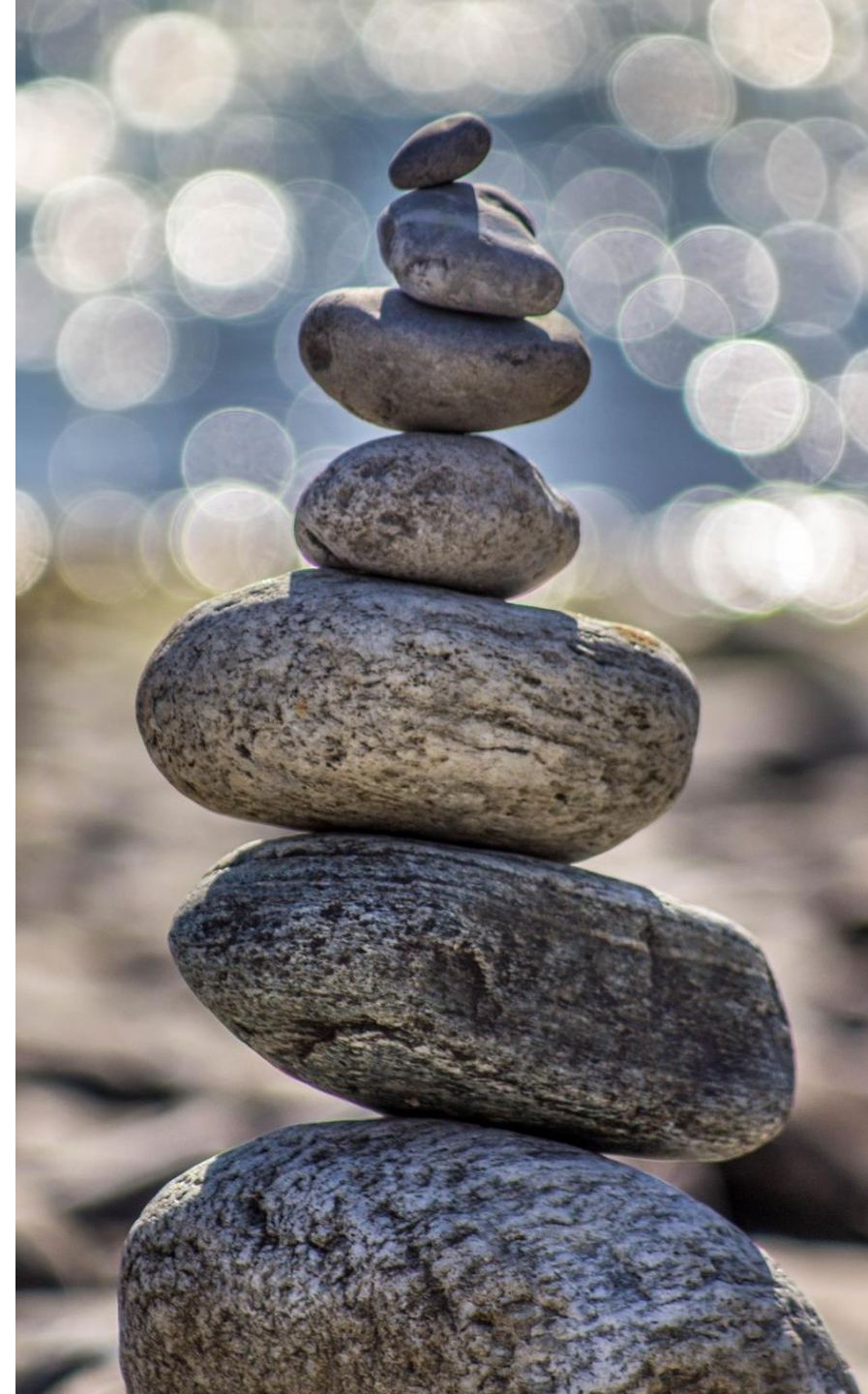
C. BICKEL/SCIENCE

History

<https://www.science.org/content/article/ready-set-share-researchers-brace-new-data-sharing-rules>

Benefits of Data Sharing

- Accelerating scientific discovery
- Fostering collaboration
- Reducing redundancy





Accelerating Scientific Discovery

- Reproducibility of research
- Meta-analysis through combined datasets



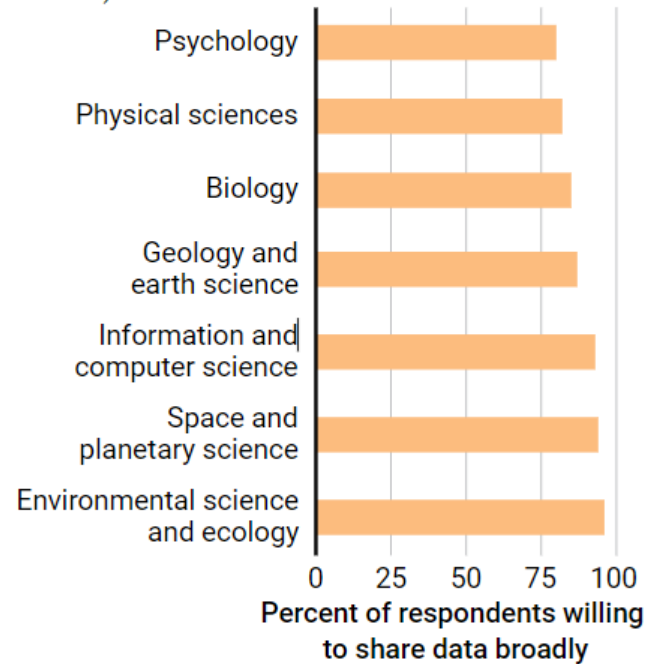
Fostering Collaboration

- Building on others' work
- Encouraging global partnerships

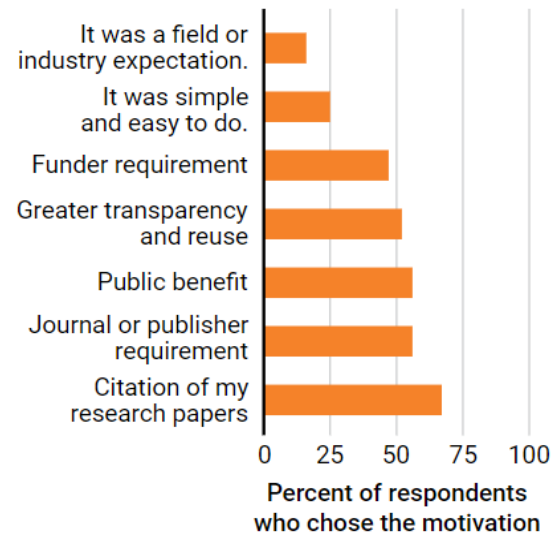
Reducing Redundancy

- Avoiding duplication of efforts
- Efficient use of funding and resources

Across fields, most scientists voice interest in the idea of sharing data, according to a 2017–18 survey of more than 2000 respondents from multiple countries. (Selected categories are shown.)



Researchers say they want professional rewards but also see other benefits, according to a survey of more than 6000 respondents in 2022. (Selected motivations are shown, and respondents could choose more than one reason.)



(GRAPHIC) K. FRANKLIN/SCIENCE; (DATA, TOP TO BOTTOM) C.

TENOPIR ET AL., *PLOS ONE*, 15(3), E0229003(2020) (2); G. GOODEY ET AL., *THE STATE OF OPEN DATA 2022*, DIGITAL SCIENCE REPORT, [HTTPS://DOI.ORG/10.6084/M9.FIGSHARE.21276984.V5](https://doi.org/10.6084/M9.FIGSHARE.21276984.V5)





Case Studies

- The Human Genome Project
- Global Earth Observation System of Systems (GEOSS)
- COVID-19 research

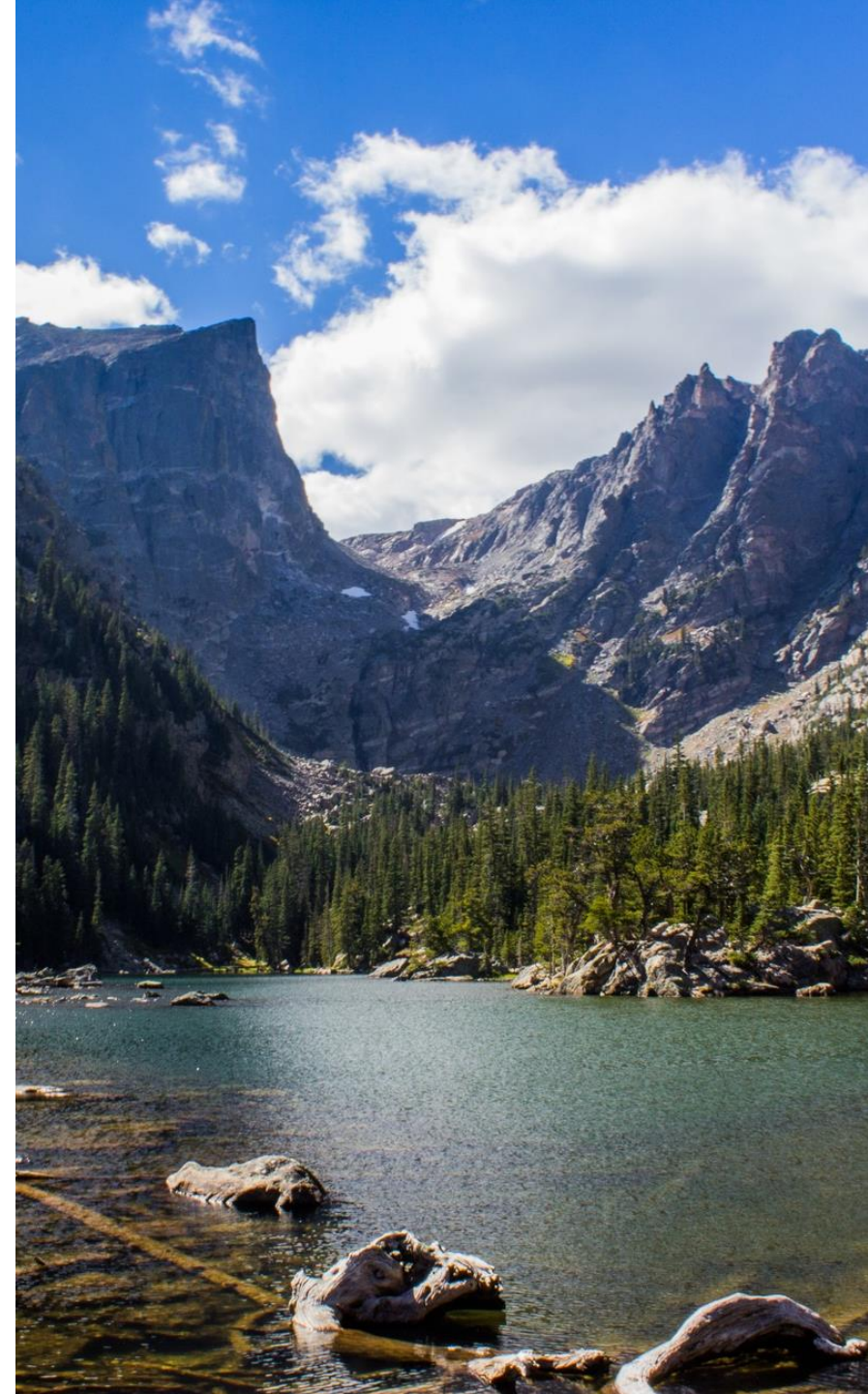


The Human Genome Project

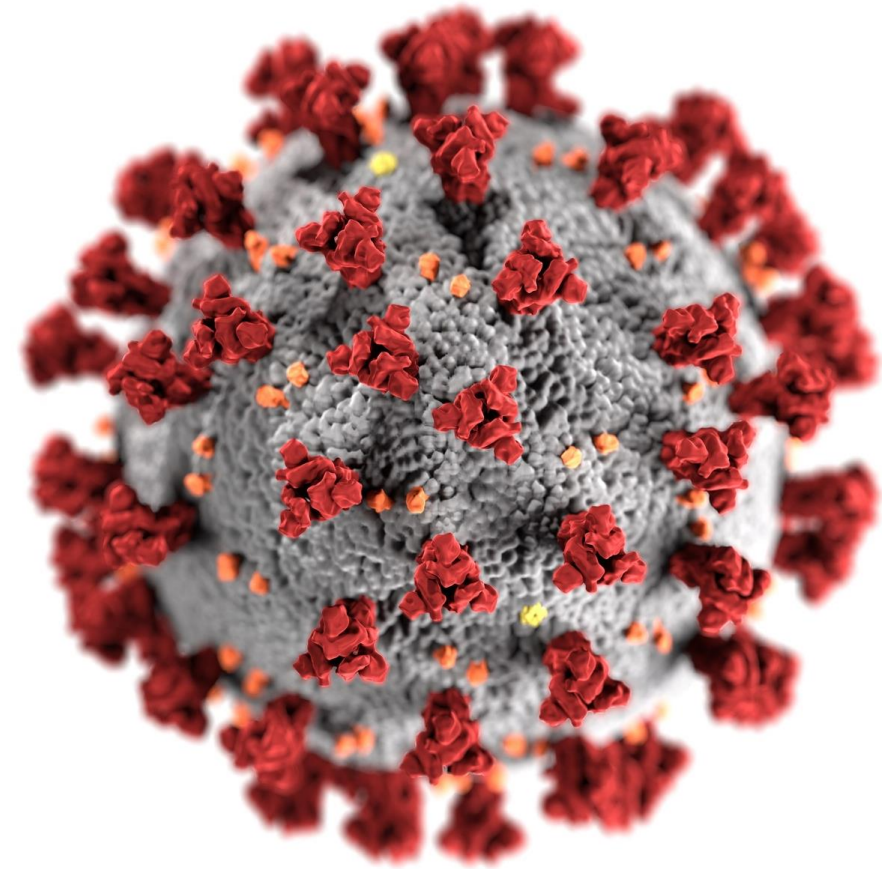
- Collaborative efforts
- Impact on genomics research

GEOSS

- Sharing environmental data
- Enhancing global understanding of Earth systems



COVID-19 Research



- Rapid data and research sharing
- Advancements in vaccine development



Challenges and Barriers

- Data privacy and confidentiality
- Intellectual property and attribution
- Technical challenges and infrastructure



Data Privacy and Confidentiality

- De-identification of sensitive data
- Ethical considerations

Intellectual Property and Attribution

- Proper credit to data creators
- Balancing openness with researchers' rights



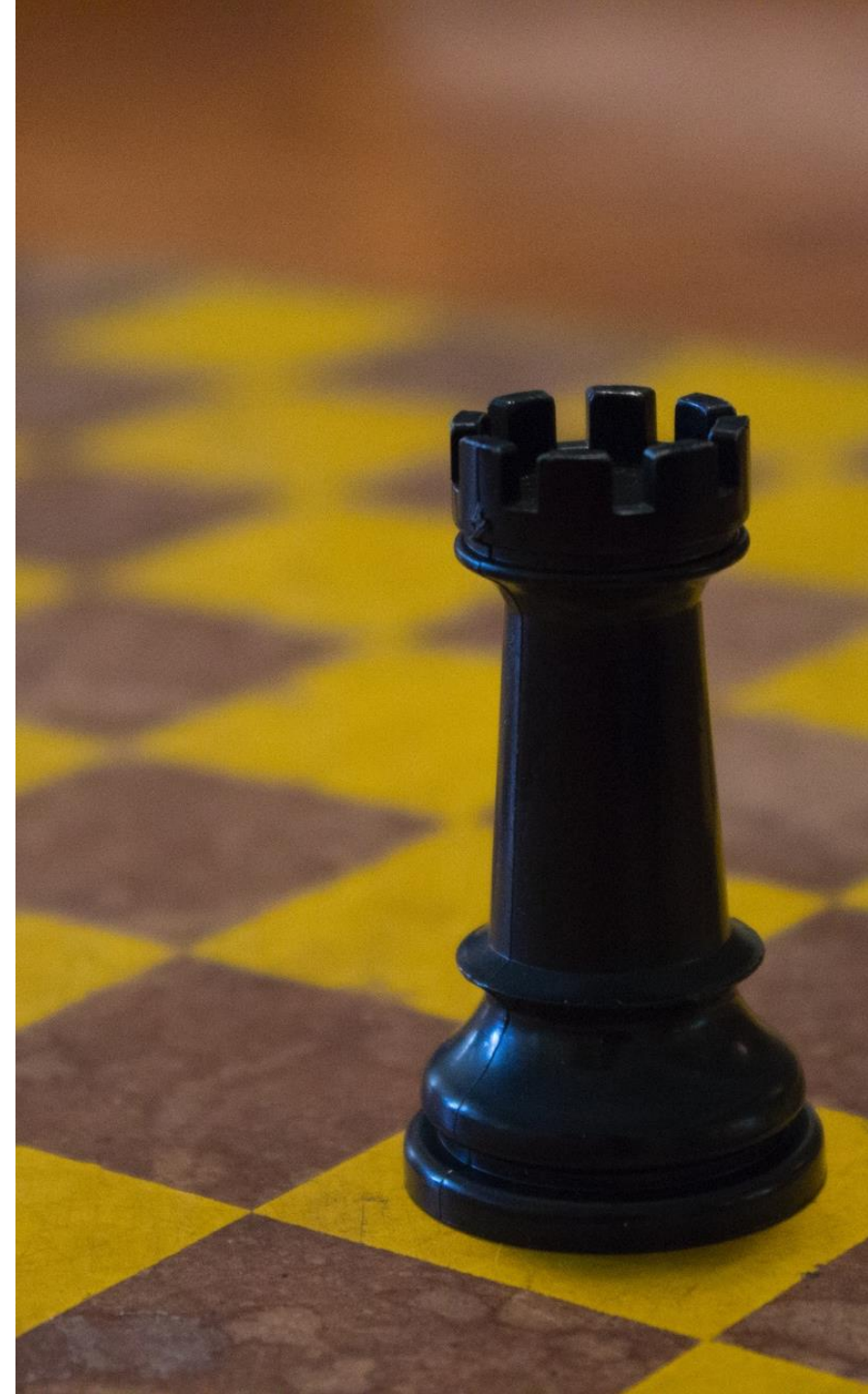


Technical Challenges and Infrastructure

- Data storage and accessibility
- Standardizing data formats and metadata

Strategies for Promoting Data Sharing

- Data sharing policies and guidelines
- Data sharing platforms and repositories
- Fostering a culture of openness and collaboration



Data Sharing Policies and Guidelines



- Roles of journals, funding agencies, and institutions
- Data sharing mandates and incentives



Data Sharing Platforms and Repositories

- Examples: Dryad, Zenodo
- Encouraging interoperability and reusability

The screenshot shows the DRYAD website homepage. At the top, there is a navigation bar with the DRYAD logo, a search bar, and links for 'Explore data', 'Who we are', 'What we do', 'Join us', 'Help', and 'Login'. Below the navigation bar is a large banner image of a blue biological tissue cross-section with the text 'Make the most of your research data' and a photo credit 'Photo DOI: 10.5062/dryad.6p14c'. A 'Submit now' button is visible in the bottom right of the banner area. Below the banner is a section titled 'How it works' with four columns: 'Login' (with an arrow icon), 'Submit' (with a cloud icon), 'Review' (with a person icon), and 'Cite' (with a quote icon). Each column contains a brief description of the step.

The screenshot shows the Zenodo website homepage. At the top, there is a navigation bar with the Zenodo logo, a search bar, and links for 'Upload', 'Communities', 'Log in', and 'Sign up'. Below the navigation bar is a large banner with the Zenodo logo and the text 'Celebrating our 10th Anniversary'. Below the banner is a section titled 'Featured communities' with a card for 'Chicago COVID-19 Response' and a 'New upload' button. Below the featured communities is a section titled 'Recent uploads' with a card for 'Electrical half hourly raw and cleaned datasets for Great Britain from 2008-11-05' and a 'View' button. On the right side, there is a section titled 'Why use Zenodo?' with a list of benefits: 'Safe', 'Trusted', 'Citable', and 'No waiting time'.

Fostering Openness and Collaboration

- Training and education for researchers
- Recognizing data sharing as valuable contribution



Conclusion

- Recap of importance and benefits
- Call to action for researchers, institutions, and policymakers
- Envisioning a future of accelerated knowledge discovery

