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The Rate of Adoption of Good Data Practices in Singapore

Mark HAHNEL

Digital Science

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A large, solid yellow rectangular box that serves as a background for the title text. It is positioned on the left side of the slide, partially overlapping the blue background.

The Rate of Adoption of Good Data Practices in Singapore

A series of four yellow squares of varying sizes, arranged in a descending staircase pattern from top-left to bottom-right, located to the right of the title box.

Mark Hahnel

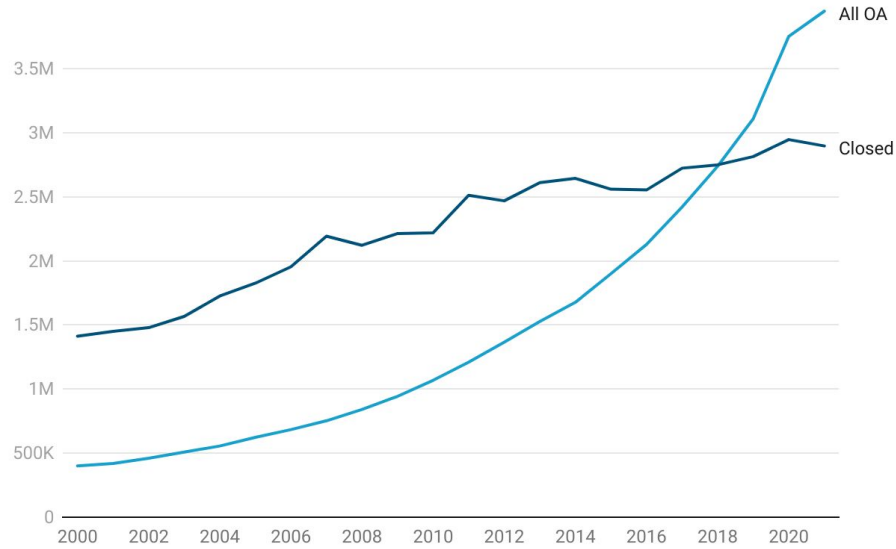
VP Open Research & Founder of Figshare



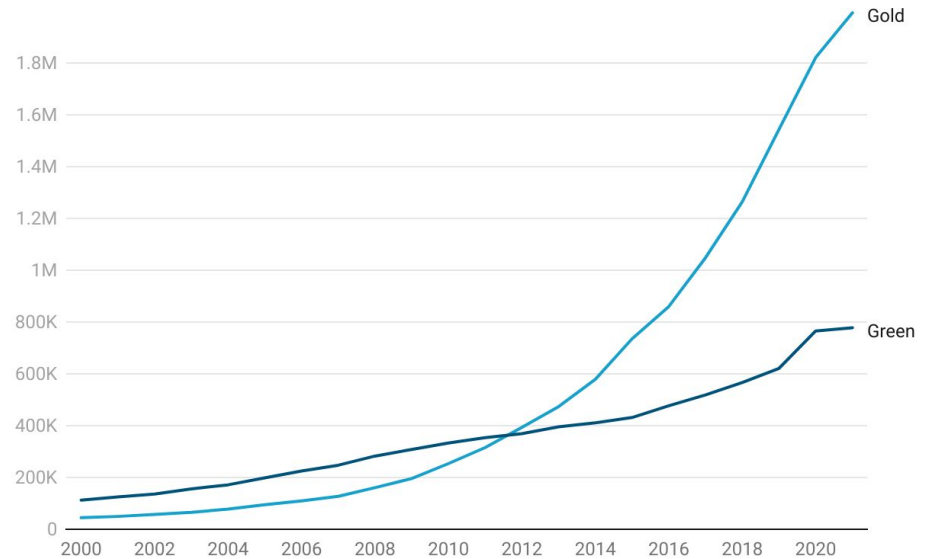
Academic Publishing Outputs



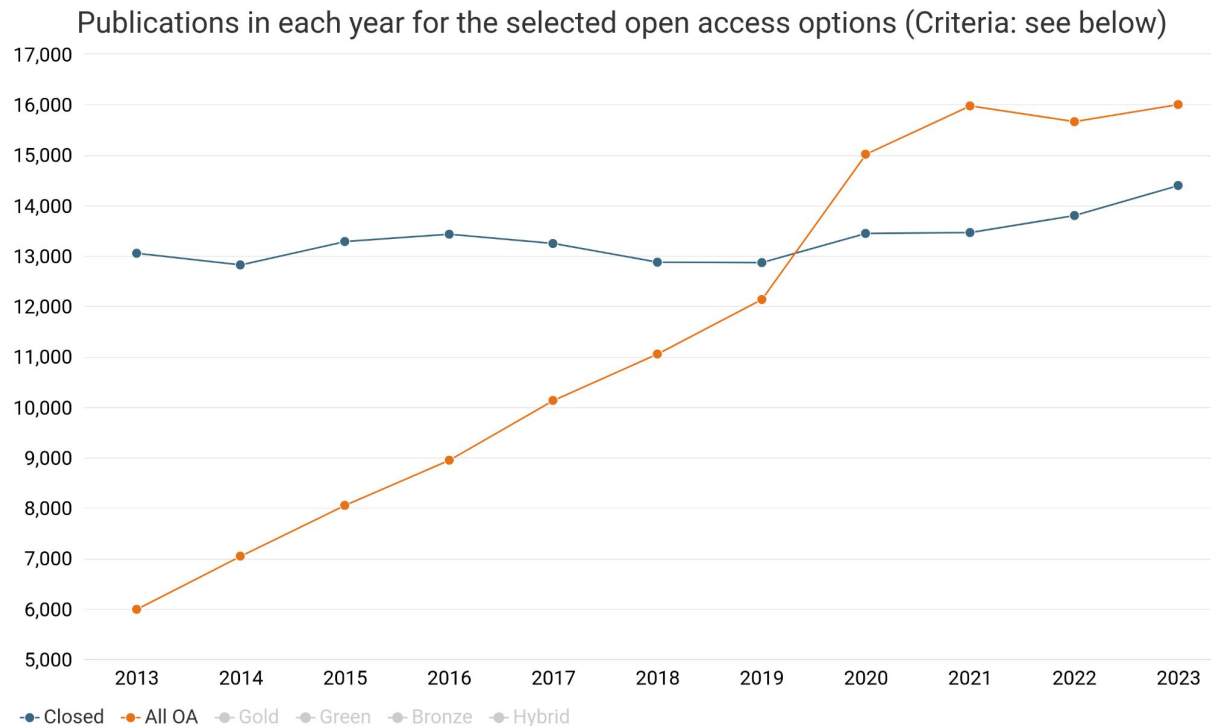
Open vs Closed Access Publishing



Gold vs Green Open Access Publishing



Open Access in Singapore



Source: <https://app.dimensions.ai>
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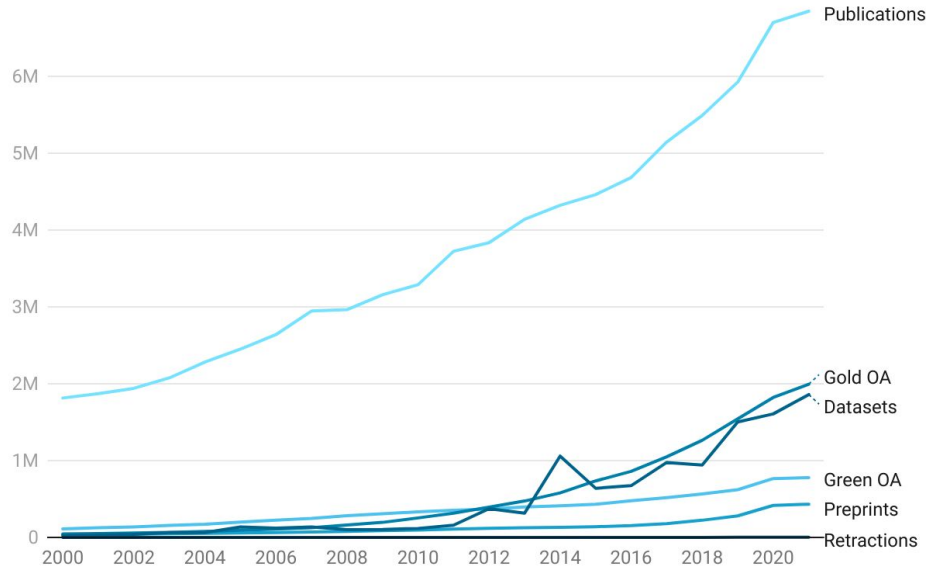
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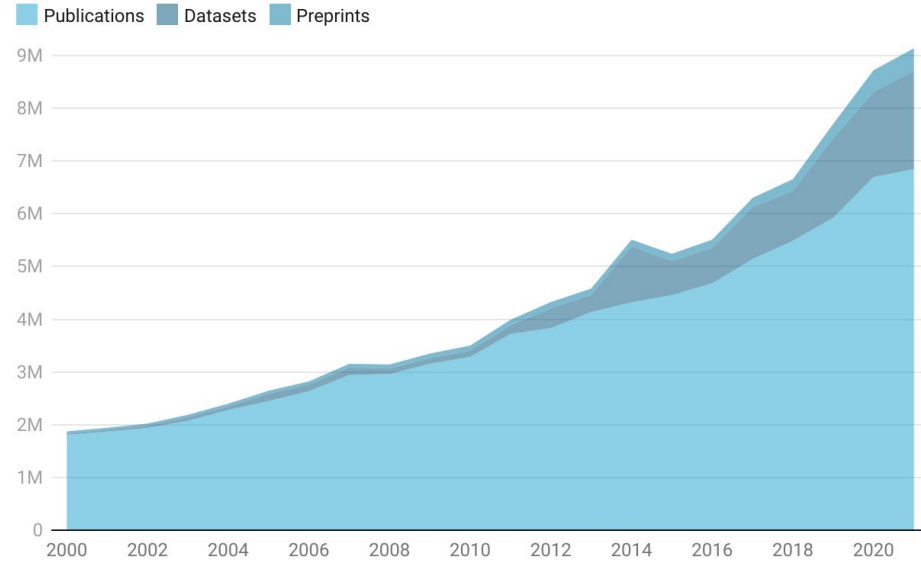
Academic Publishing Outputs



Academic Publishing Outputs



Cumulative Academic Publishing Outputs





Why?



SPRINGER NATURE

The State of Open Data

Has been running for 9 years

Had over 30,000 respondents from 192 countries over that time

2023 had first partner publication from CAS

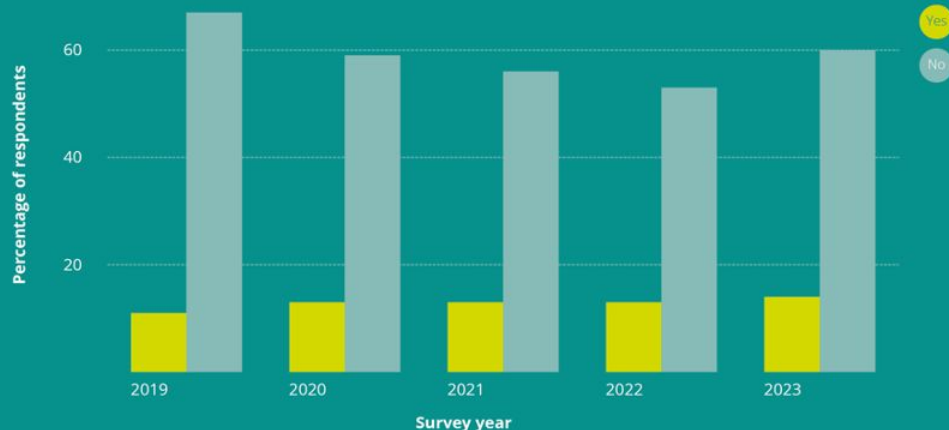




Credit is an ongoing issue

For eight years running, our survey has revealed a recurring concern among researchers: the perception that they don't receive sufficient recognition for openly sharing their data.

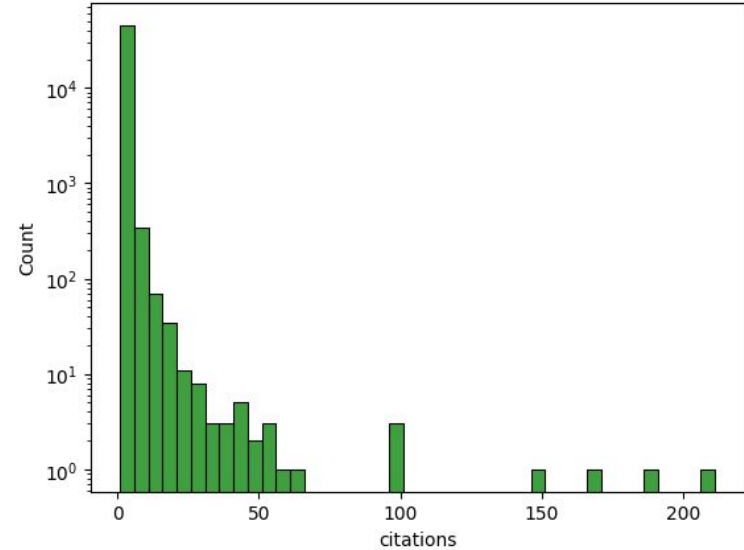
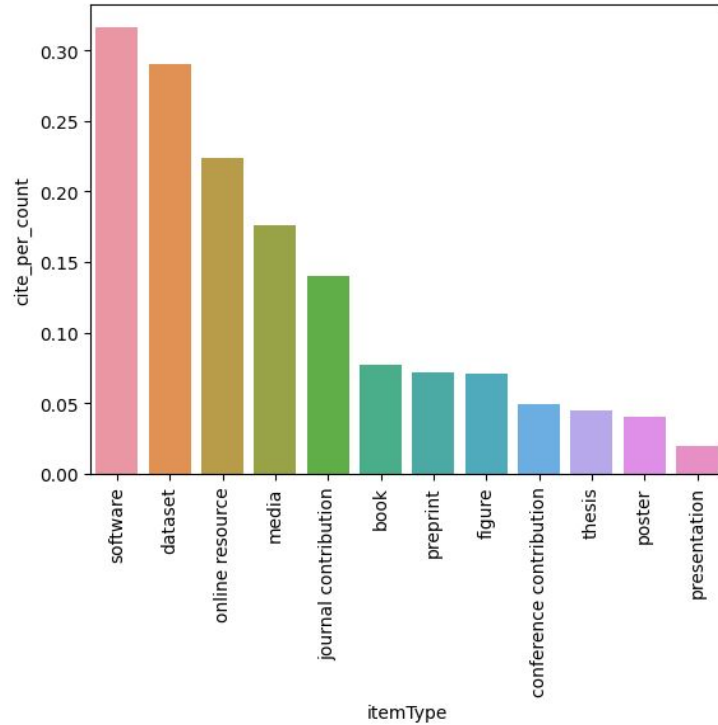
Do you think researchers currently get sufficient credit for sharing data?



Longitudinal survey data from 2019-2023 for the question 'Do you think researchers currently get sufficient credit for sharing data?'



Citation Counts on Figshare.com





Support is not making its way to those who need it

Almost three-quarters of respondents had never received support with making their data openly available.

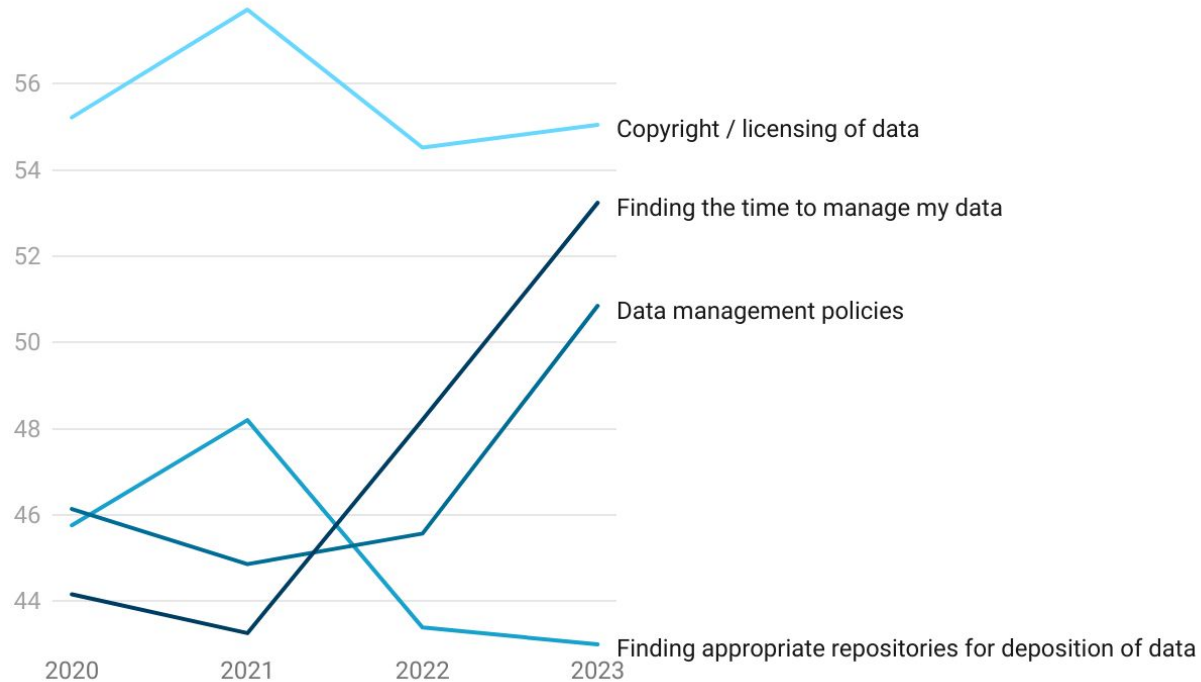
Do you have access to support from specialist data managers?



What percentage of researchers “strongly agree” that the following should be made open, by job title?

The State of Open Data

What areas, if any, do you feel you need help with in regard to making your research data openly available?



The State of Open Data 2023

One size does not fit all

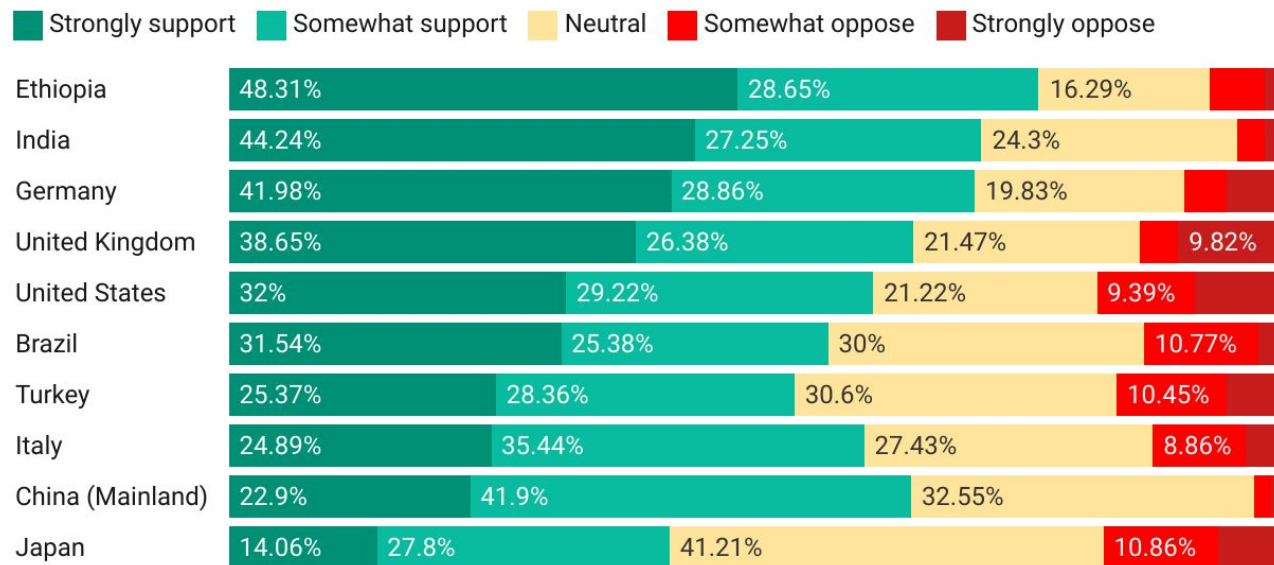


Variations in responses from different subject expertise and geographies highlight a need for a more nuanced approach.

[#StateOfOpenData](#)

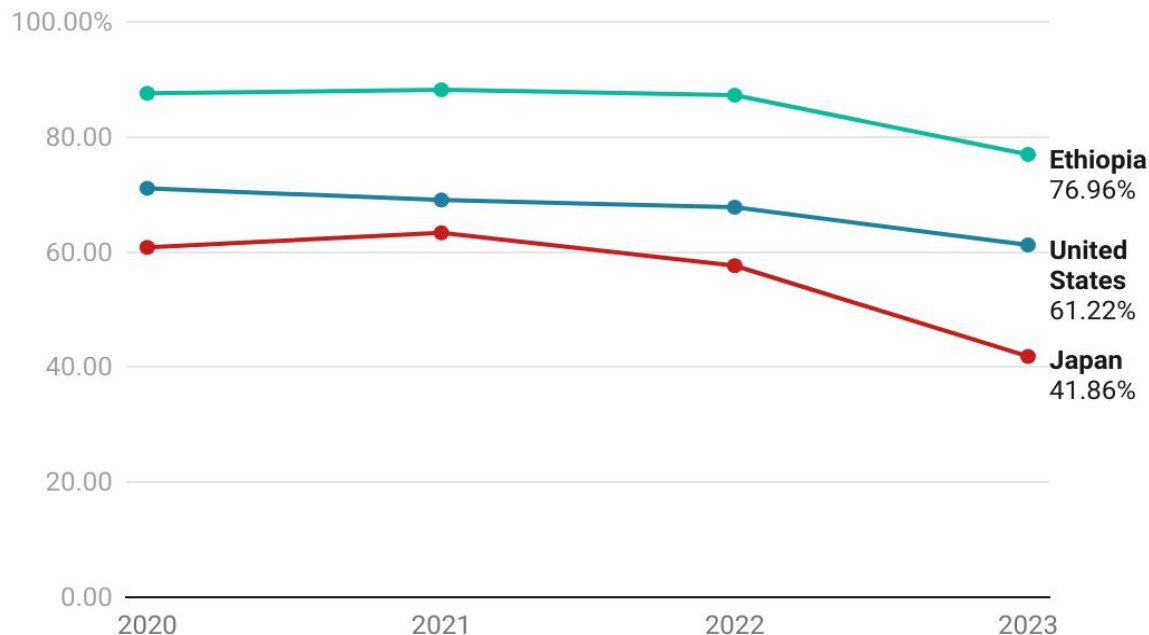


Thinking about the country in which you are currently working, how supportive are you of the idea of a national mandate for making research data openly available?



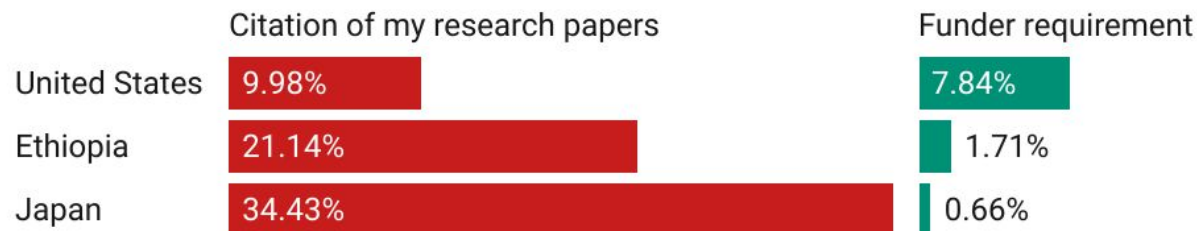


How supportive would you be of a national mandate for making research data openly available?



Which one of these circumstances would motivate you the most to share your data?

■ Citation of my research papers ■ Funder requirement



as a proportion of total responses to survey question

Created with Datawrapper

*“Linking papers to their supporting data in a repository was associated with on average a **25% increase in citations**”*

<https://doi.org/10.1371/journal.pone.0230416>

 OPEN ACCESS  PEER-REVIEWED

RESEARCH ARTICLE

The citation advantage of linking publications to research data

Giovanni Colavizza, Iain Hrynaszkiewicz, Isla Staden, Kirstie Whitaker, Barbara McGillivray 

Published: April 22, 2020 • <https://doi.org/10.1371/journal.pone.0230416>

107
Save

40
Citation

11,051
View

967
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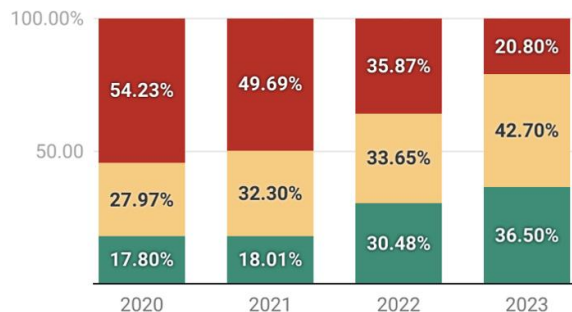
Print

Share

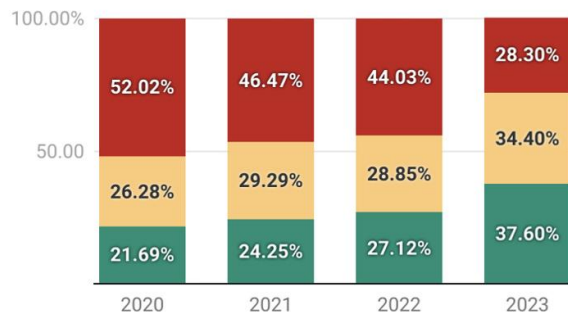


How familiar are you with the FAIR data principles in relation to Open Data?

■ I am familiar with the FAIR data principles ■ I have previously heard of the FAIR data principles but I am not familiar with them ■ I have never heard of the FAIR data principles



A. Ethiopia



B. United States



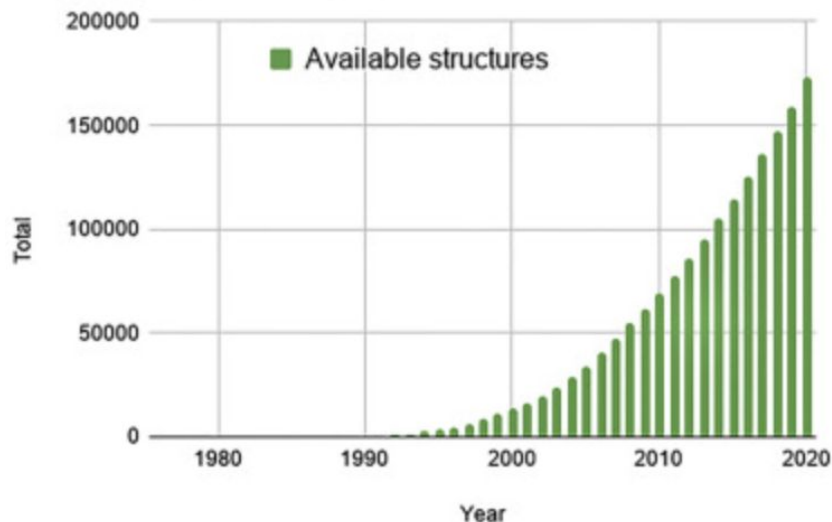
C. Japan

But why?



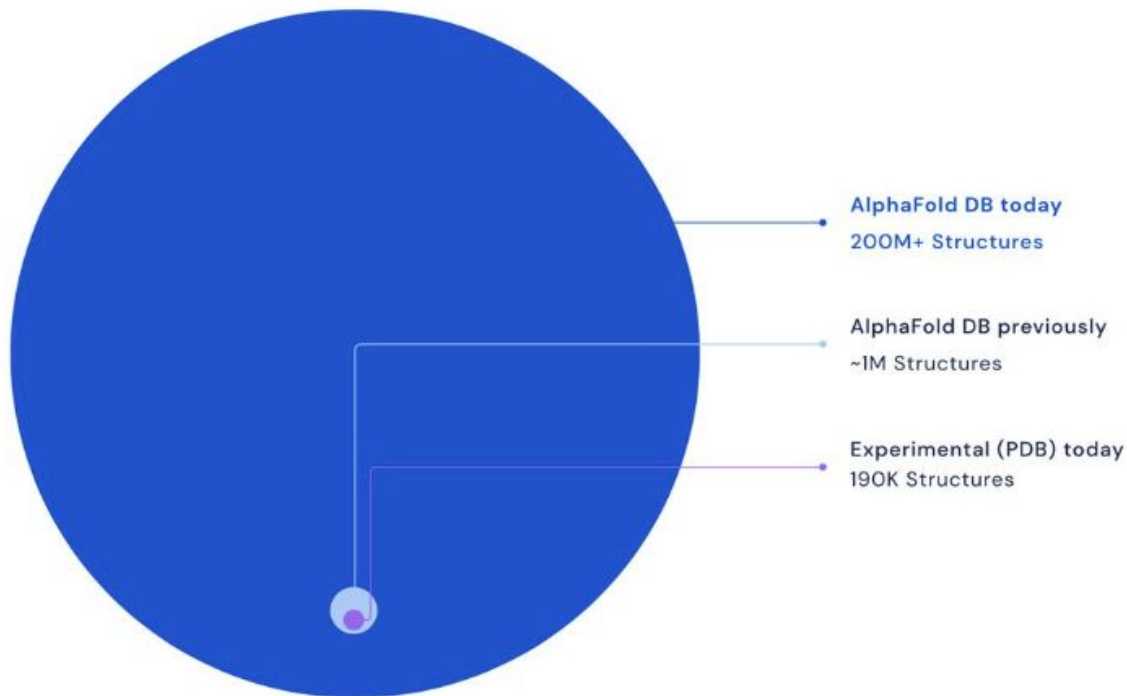
“We trained this system on publicly available data consisting of ~170,000 protein structures from the protein data bank”

Growth of the PDB Archive



The estimated replacement cost of current PDB archival contents exceeds US\$20 billion (assuming an average cost of US\$100,000 for regenerating each of the >200,000 experimental structures).

<https://www.rcsb.org/pages/about-us/economic-impact>



At launch

$$\$100,000 * 1,000,000 = \$100,000,000,000$$

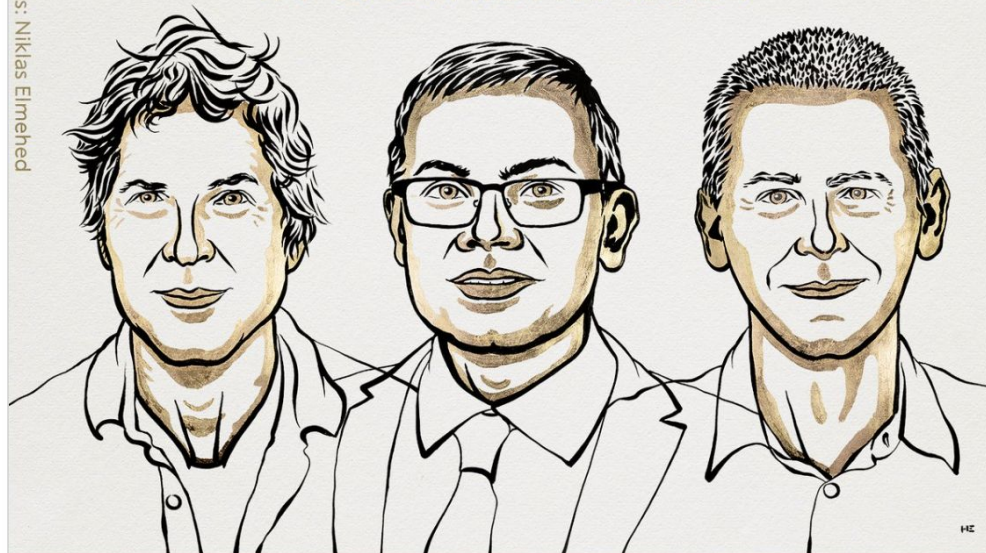
After 1 year

$$\$100,000 * 200,000,000 = \$20,000,000,000,000$$



Illustrations: Niklas Elmehed

THE NOBEL PRIZE IN CHEMISTRY 2024



David
Baker

“for computational
protein design”

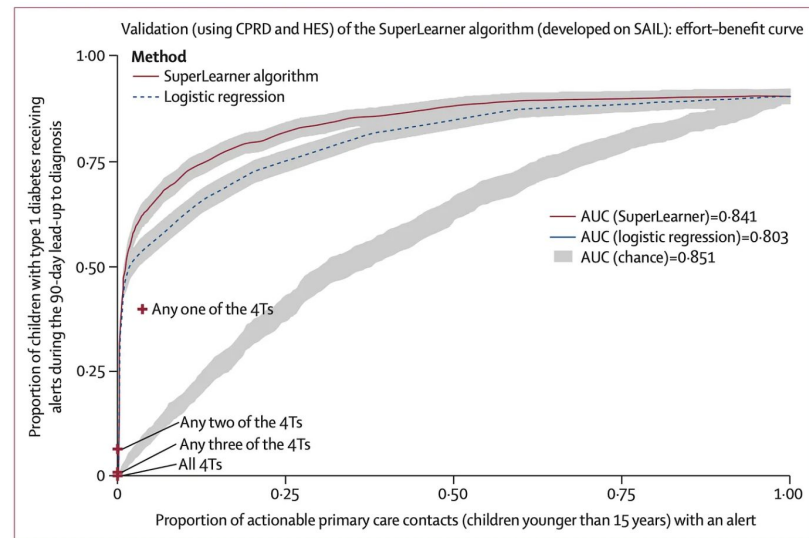
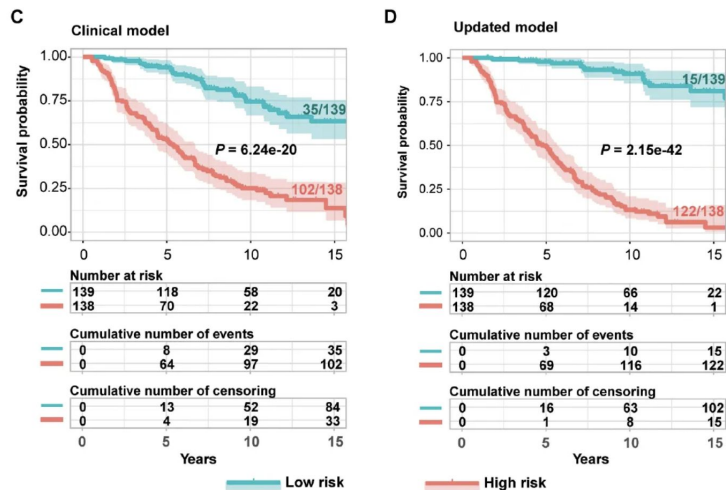
Demis
Hassabis

“for protein structure prediction”

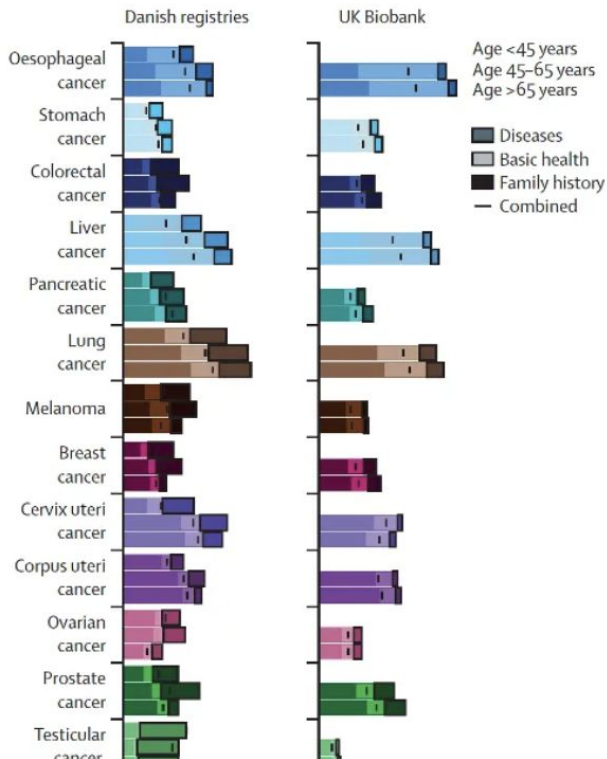
John M.
Jumper

Multiple omics (DNA methylations, proteins, micro-RNAs, gene variants) for predicting kidney disease and failure in people with Type 1 diabetes compared with the standard clinical model for risk

Predicting Type 1 diabetes and timing in children



Predicting multi-cancer risk over 3-years using a national health resource (Denmark)

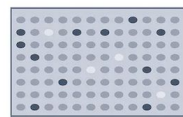


CHANGING DRUG-DISCOVERY PIPELINES

Advances in artificial-intelligence (AI) tools and innovations in protein science and laboratory techniques mean that protein drugs can be developed faster and more efficiently today than was possible using older methods.

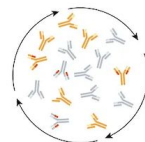


Conventional drug discovery



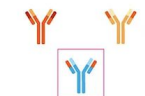
High-throughput screening identifies a handful of proteins that bind to a desired target at an appropriate strength.

6 months ↓



Many cycles of engineering are needed to modify the proteins so that they have the properties a drug needs.

18 months ↓



Modified proteins are rigorously tested to see whether they are safe, efficient and suitable for

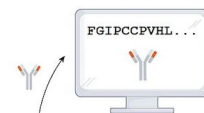
AI and automation



Machine-learning models will soon be used to filter for protein sequences that bind to the desired target.

Less than 3 months ↓

Such AI tools find likely binding sequences in an initial pool of millions.



Other machine-learning models are used to predict the properties that these protein sequences will have and to design improved candidates.

Feedback improves the predictions.



Automated assays test candidates.

6 months ↓



Higher confidence in the methods used means fewer candidates need to be rigorously

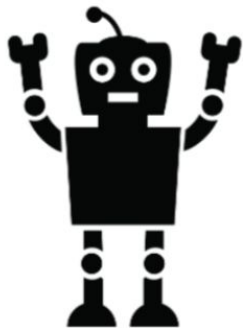


Leaps in technology are supporting AI-guided drug design, such as this fully robotic workstation that can purify proteins and move liquids.

AI can help to speed up drug discovery — but only if we give it the right data



FAIR



FAIR

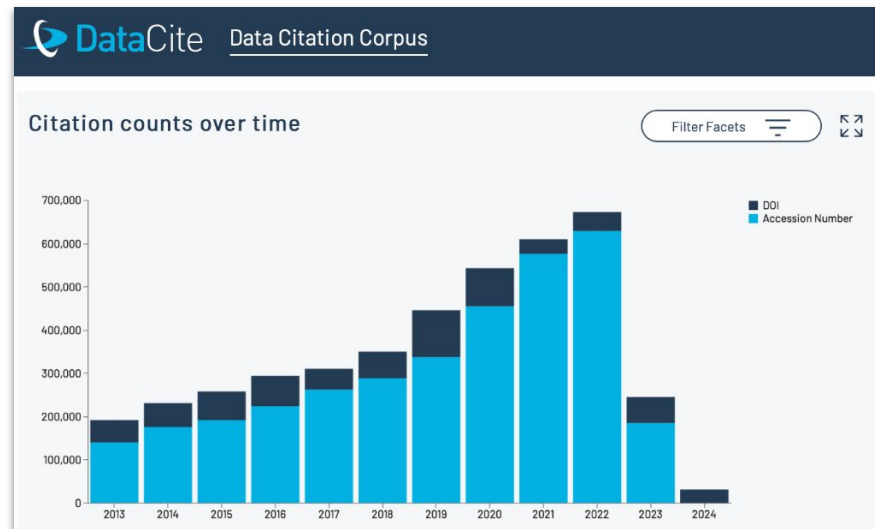
But why me as
a researcher?

The Data Citation Corpus

- Open aggregate of data citations
- 5 million citations
- Citations from diverse sources, including DOI metadata and machine learning

Check the latest data file for the Data Citation Corpus:

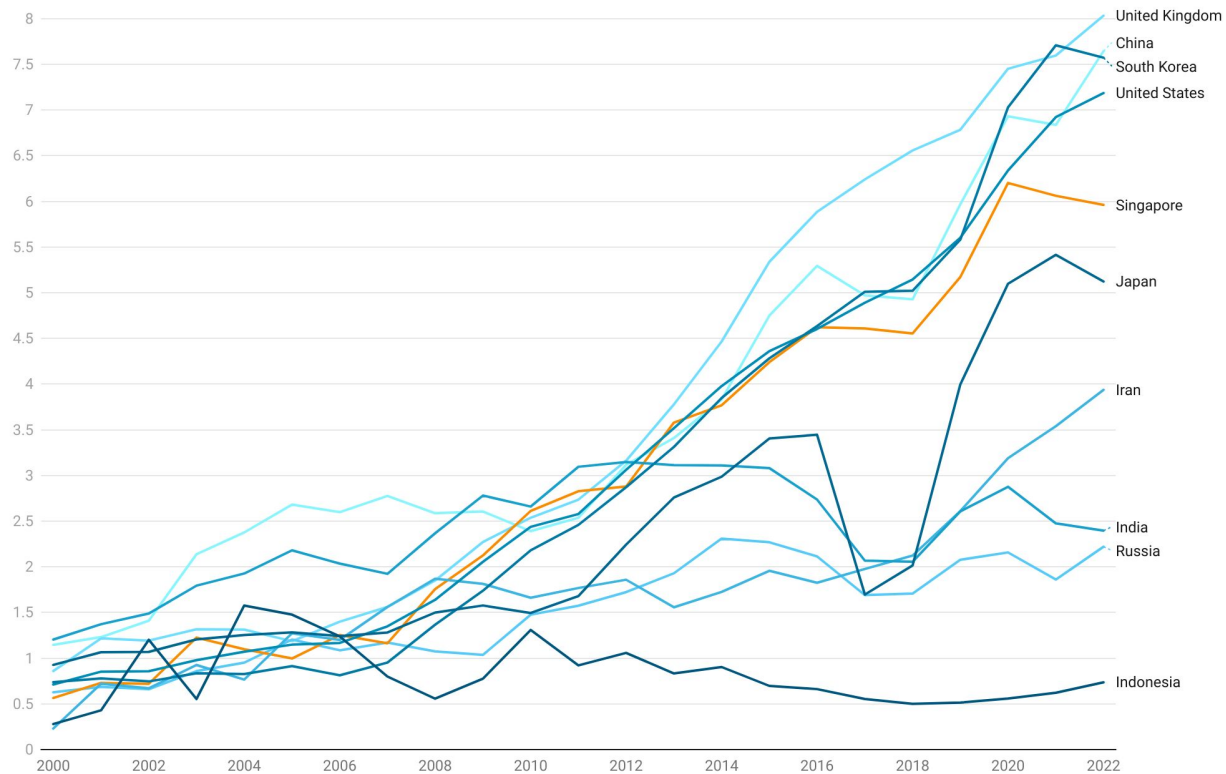
[10.5281/zenodo.11196858](https://zenodo.org/record/11196858/files/10.5281/zenodo.11196858)



Data Citation Corpus dashboard:

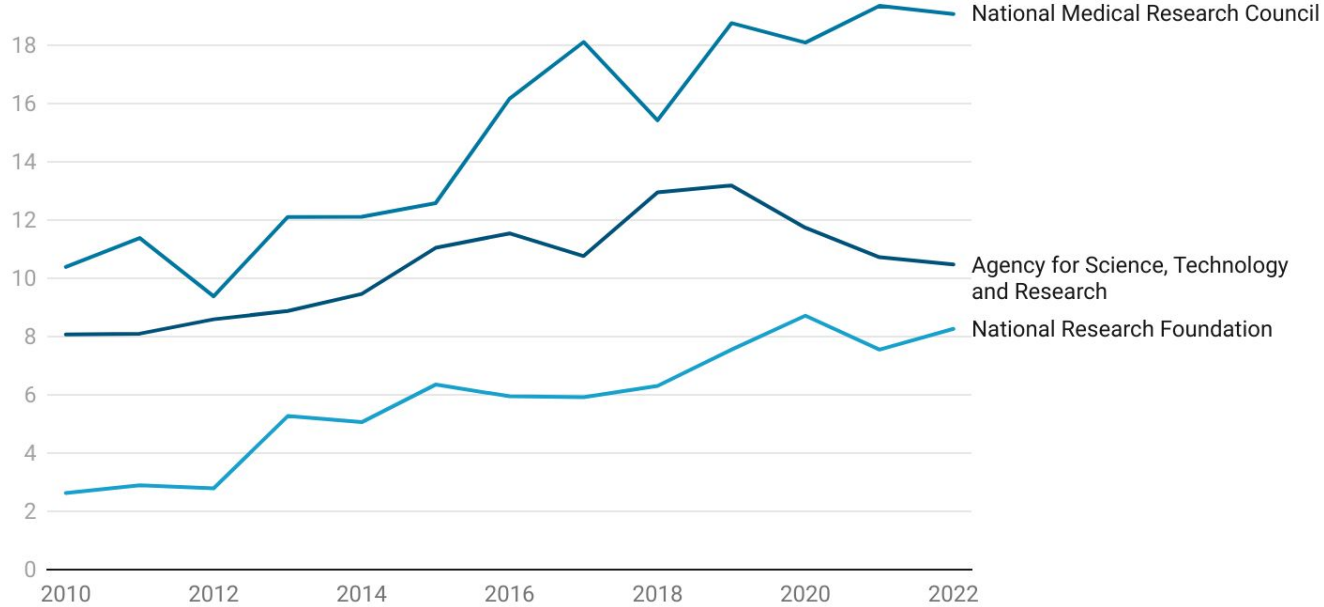
<https://corpus.stage.datacite.org/dashboard>

Percentage of papers with a link to a dataset in the CZI corpus



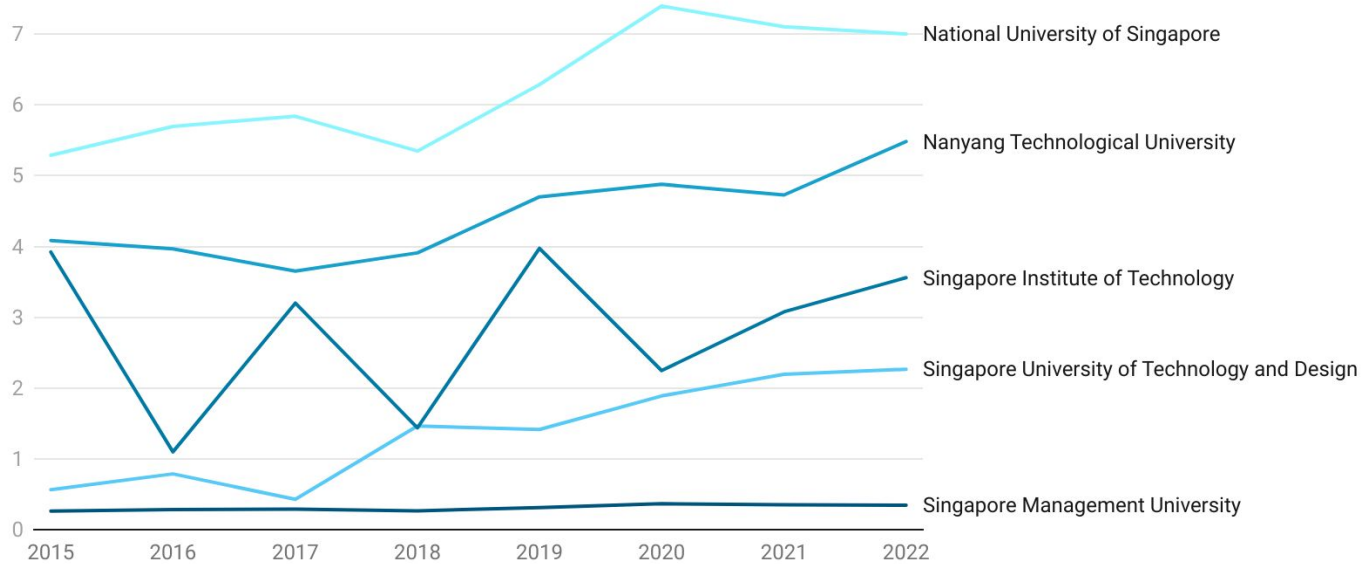


Percentage of papers funded by Singaporean funders with a link to a dataset in the CZI corpus





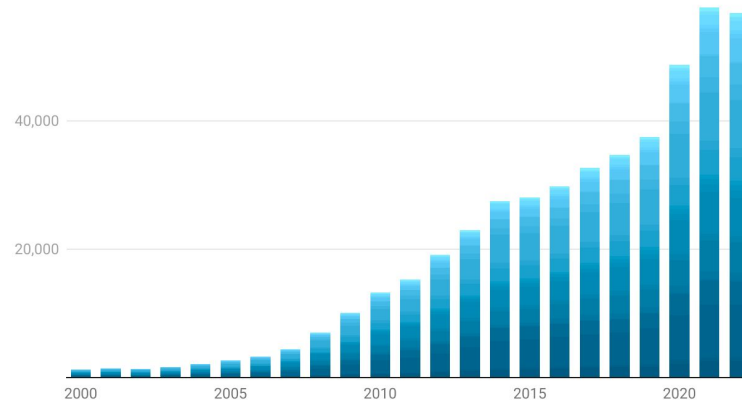
Percentage of papers from Singapore Universities linking to datasets



Policy > Mandate > Compliance > Measurement

Number of NIH Funded papers with a link to a dataset - based on Data Citation Corpus

Center for Information Technology Center for Scientific Review Eunice Kennedy Shriver National Institute of Child Health and Human Development Fogarty International Center National Cancer Institute National Center for Advancing Translational Sciences National Center for Complementary and Integrative Health National Eye Institute National Heart Lung and Blood Institute National Human Genome Research Institute National Institute of Allergy and Infectious Diseases National Institute of Arthritis and Musculoskeletal and Skin Diseases National Institute of Biomedical Imaging and Bioengineering National Institute of Dental and Craniofacial Research National Institute of Diabetes and Digestive and Kidney Diseases National Institute of Environmental Health Sciences National Institute of General Medical Sciences National Institute of Mental Health National Institute of Neurological Disorders and Stroke National Institute of Nursing Research National Institute on Aging National Institute on Alcohol Abuse and Alcoholism National Institute on Deafness and Other Communication Disorders National Institute on Drug Abuse National Institute on Minority Health and Health Disparities National Institutes of Health Clinical Center United States National Library of Medicine





NIH Data Sharing Index (S-index) Challenge

Promoting data sharing and developing a robust metric to reward exemplary data sharers.

This Challenge aims to incentivize and reward data sharing excellence, promoting a new metric for assessing how effectively researchers share valuable data, driving a culture of openness in science.



Apply starting 04/21/25


 Follow challenge (51)

 Share

Submission period: Phase 1 opens on 04/21/25 01:00 PM GMT+1

Challenge type: Scientific

Total cash prizes: \$1,000,000

 [Print challenge](#)

Research Transformation

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