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CENTER FOR OPEN SCIENCE

Challenges and opportunities with data sharing

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Center for Open Science

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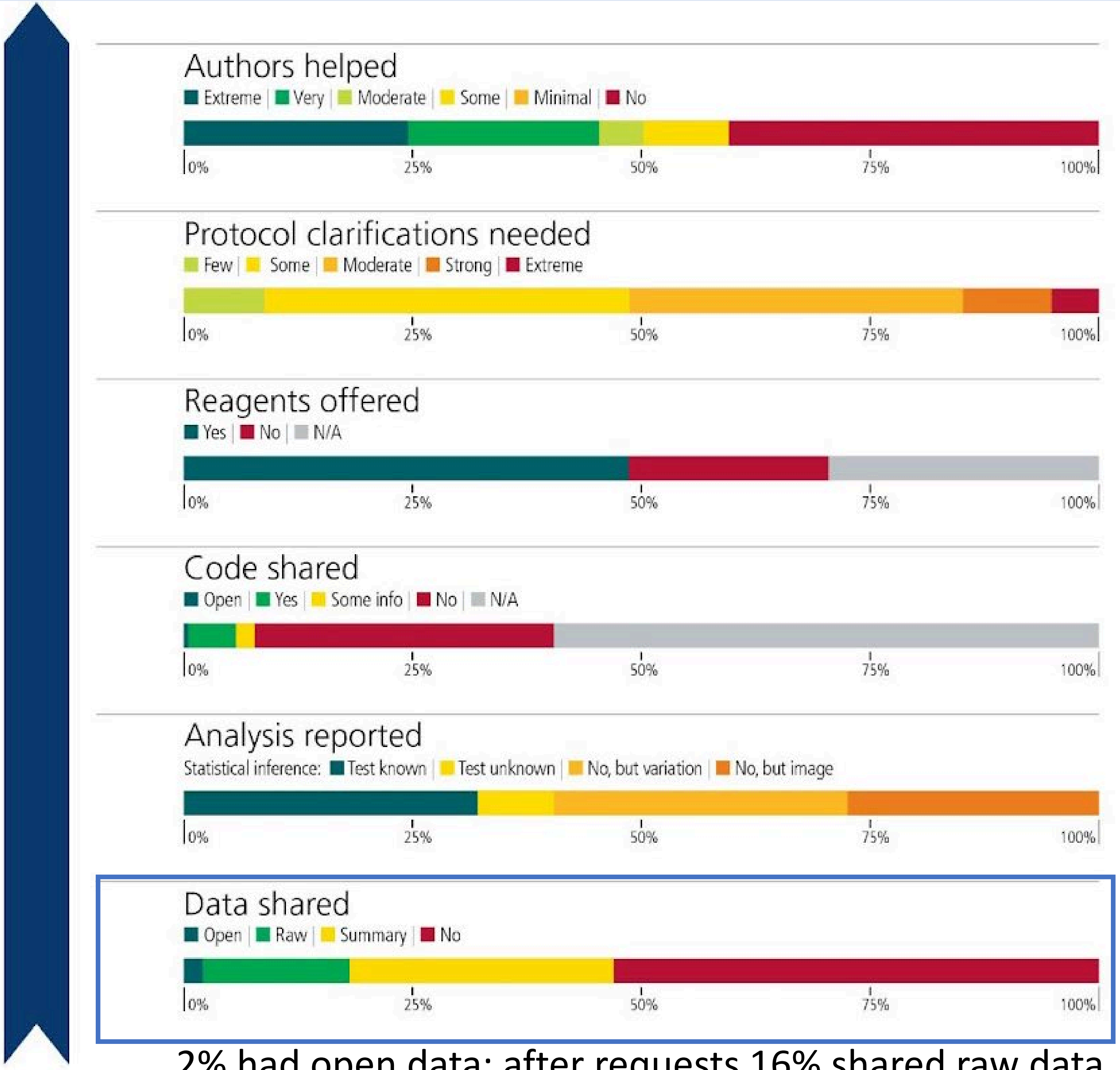
Outline

- Rates of data sharing
- Attitudes of authors towards data sharing
- Behaviors of data sharing
- FAIR data sharing
- Challenges of data sharing
- Opportunities

How often were data shared?

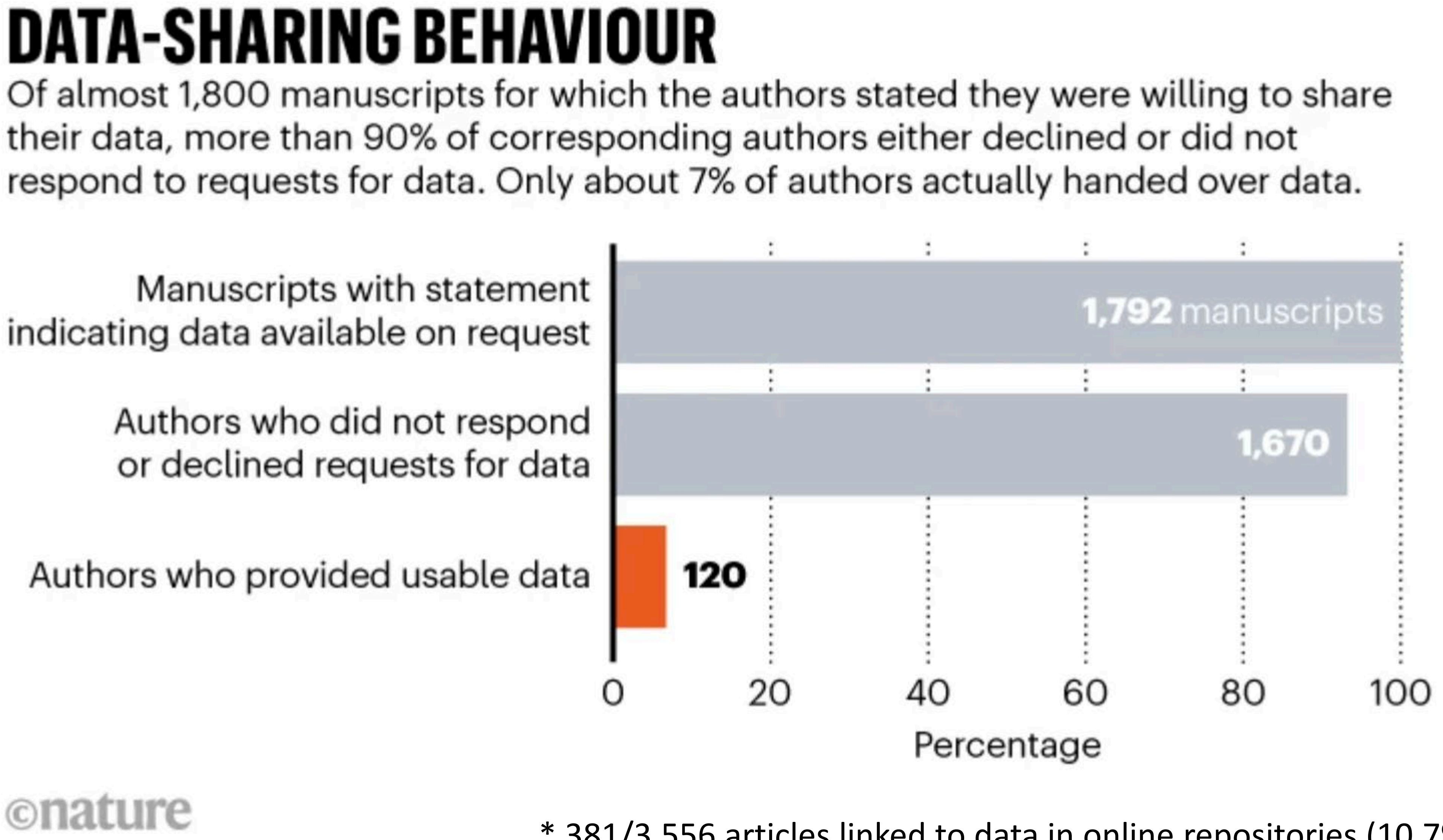
DESIGNED
193 experiments



Errington et al., 2021

2% had open data; after requests 16% shared raw data

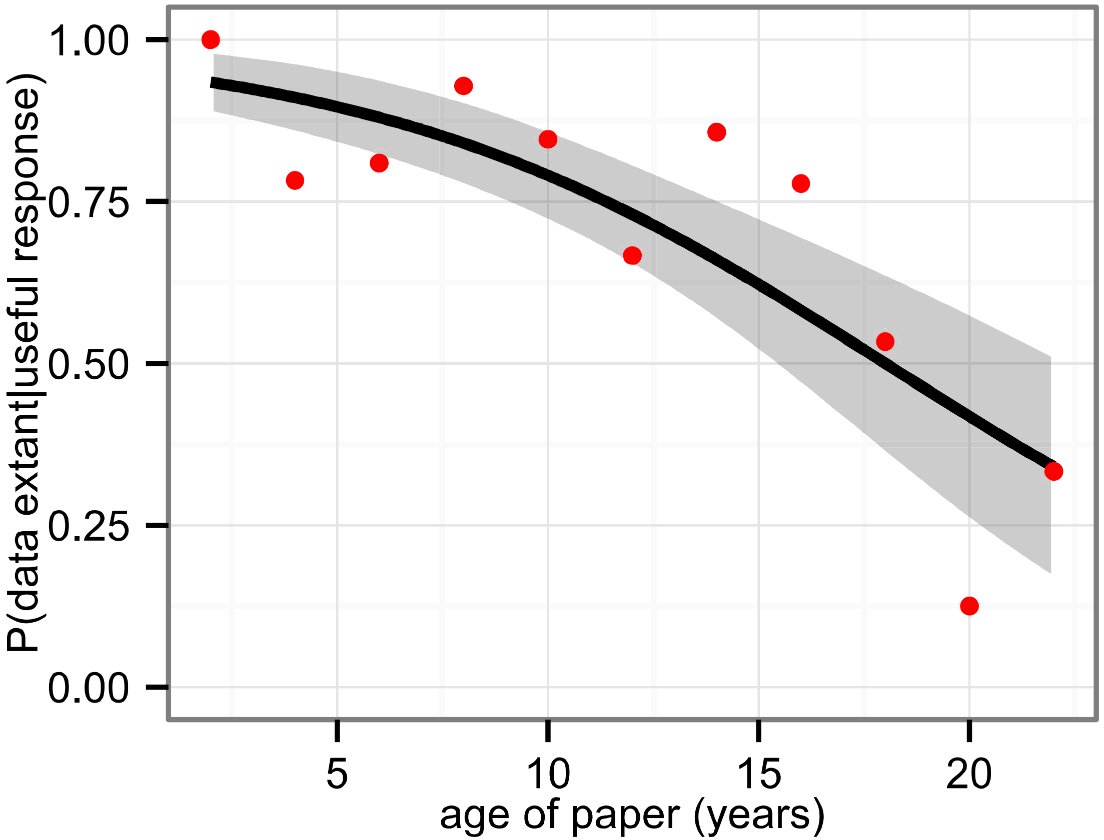
How often were data shared?

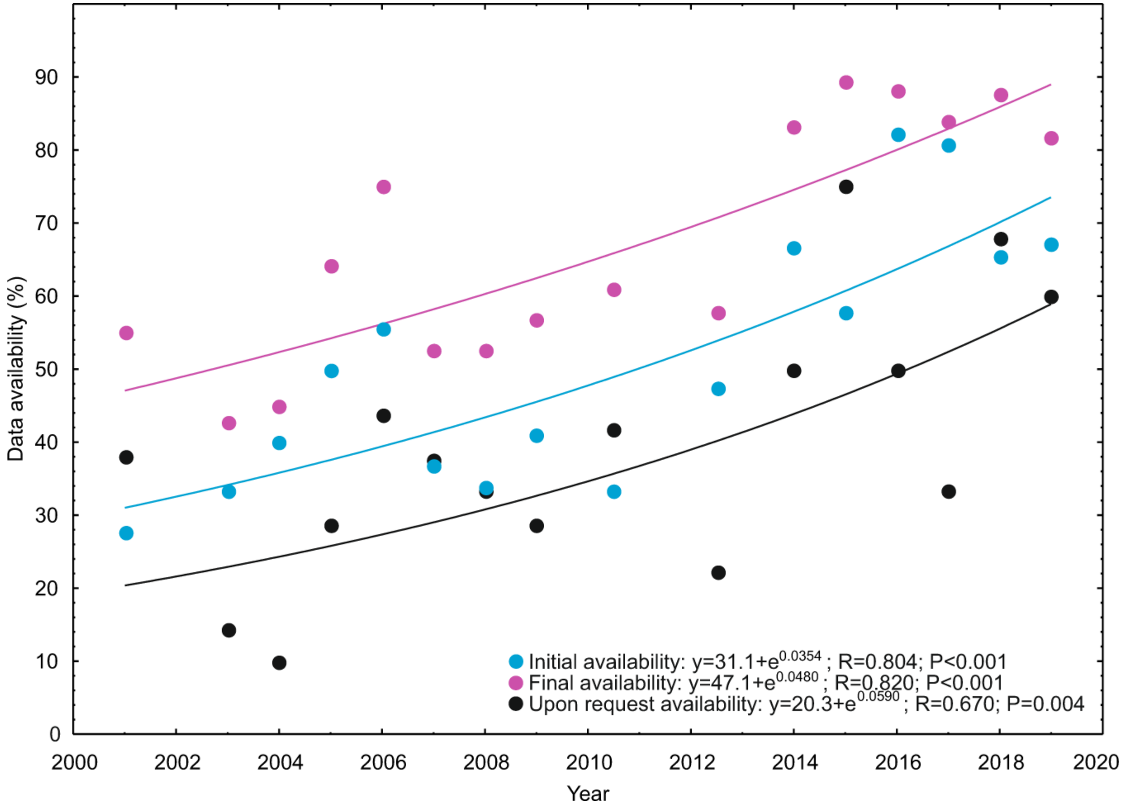


* 381/3,556 articles linked to data in online repositories (10.7%)

Gabelica et al., 2022; Watson, 2022

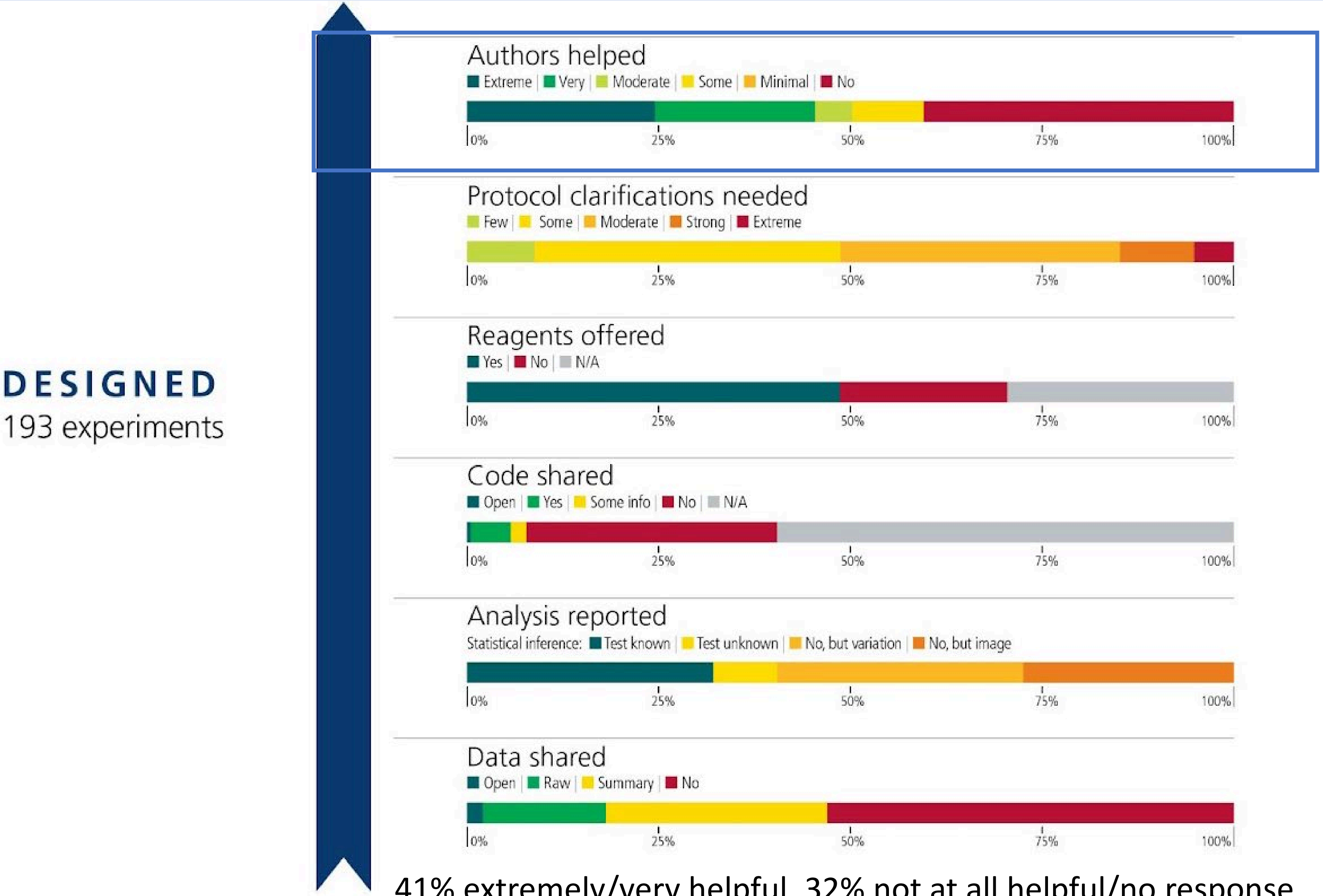
Data access declines with age





Vines et al., 2013; Tedersoo et al., 2021

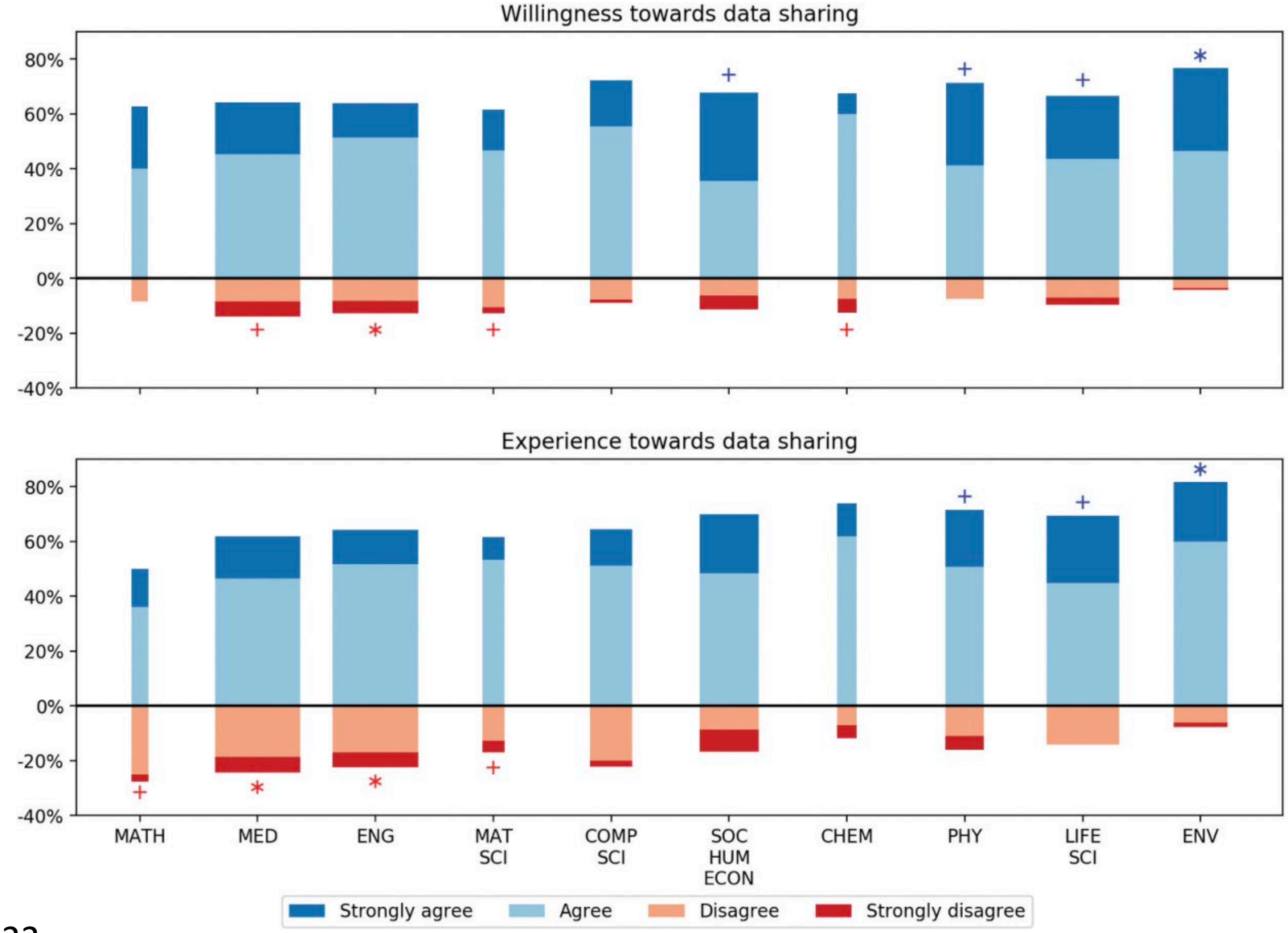
How often was help provided?



41% extremely/very helpful, 32% not at all helpful/no response

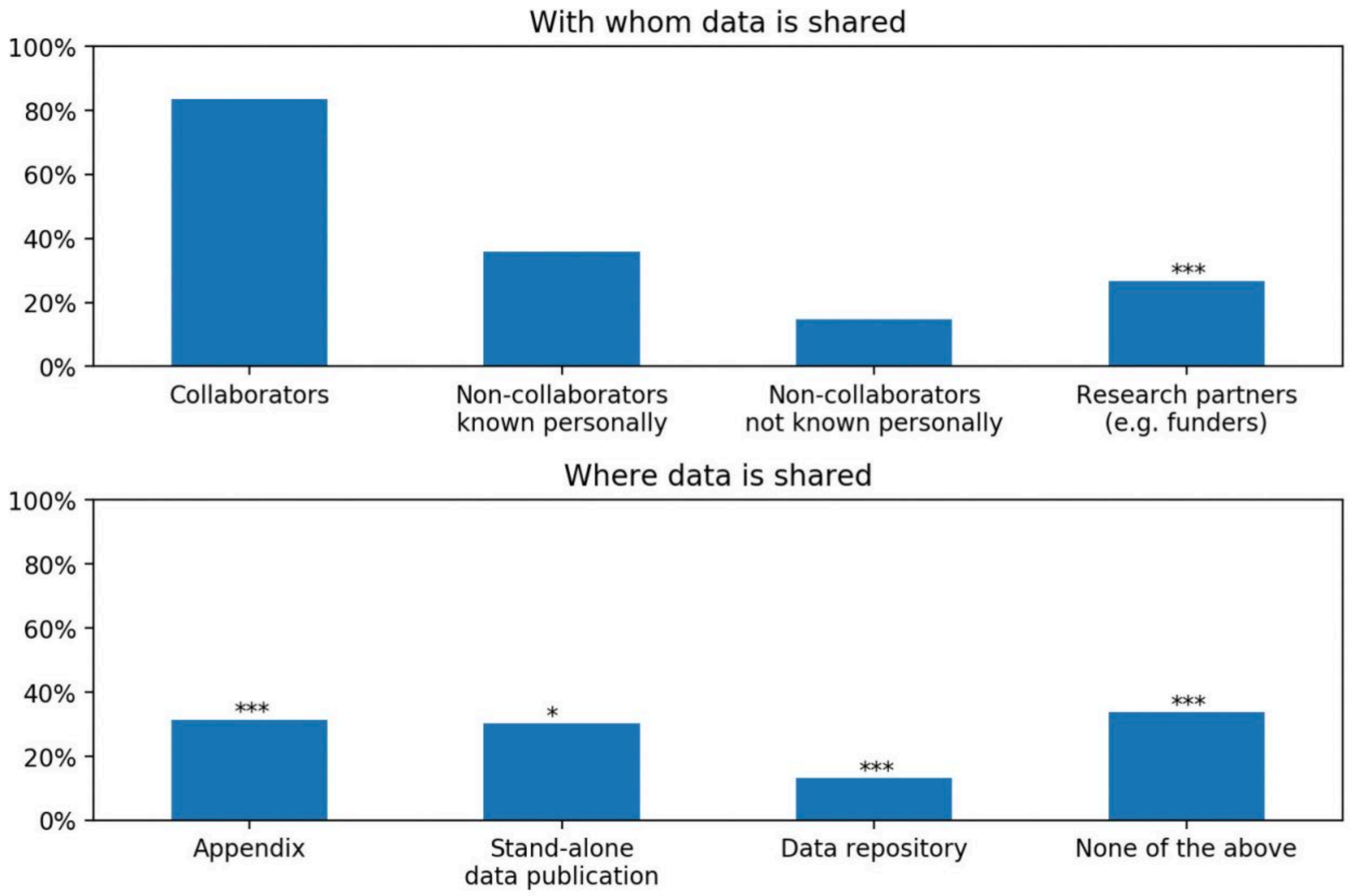
Errington et al., 2021

Attitudes towards data sharing by discipline



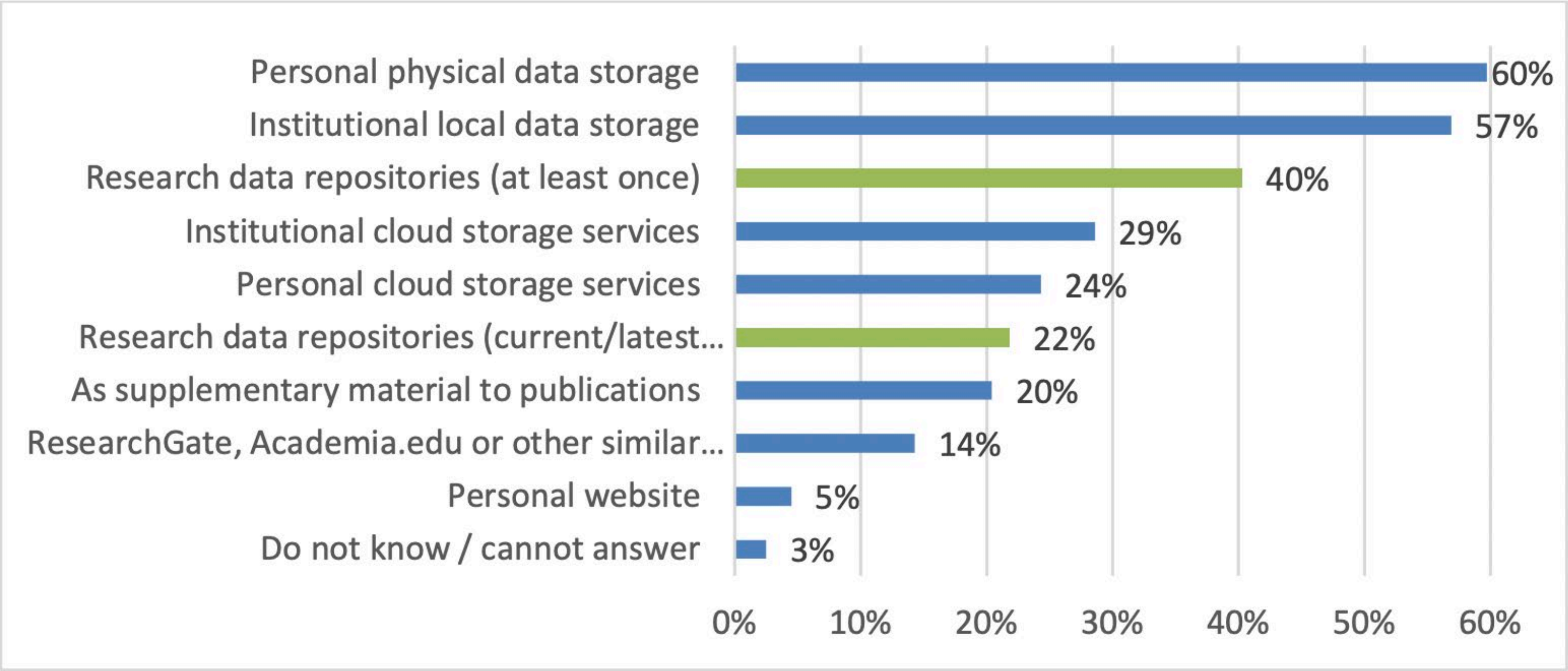
Pujol Priego et al., 2022

Data sharing behaviors



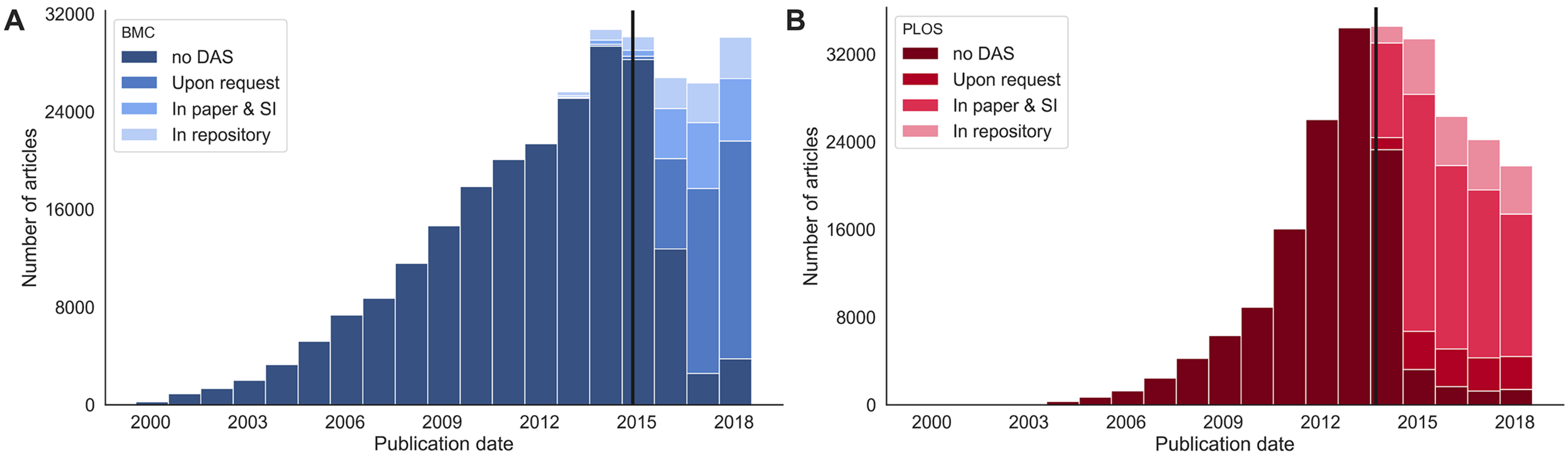
Pujol Priego et al., 2022

Where do researchers store their research data?



European Commission, 2022

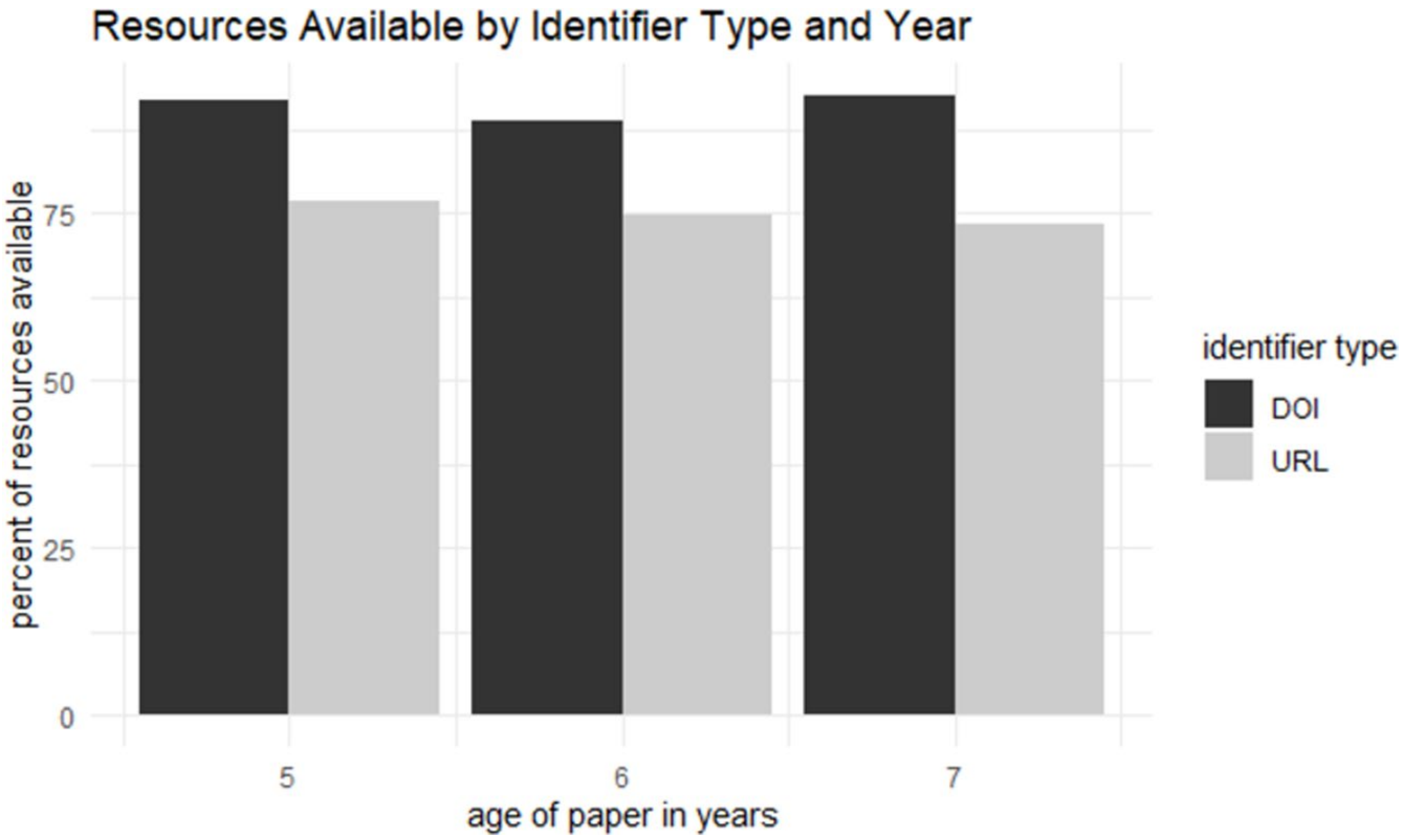
Data Availability Statements Over Time



Correlation of up to 25.36% more citations for articles that share their data in a repository

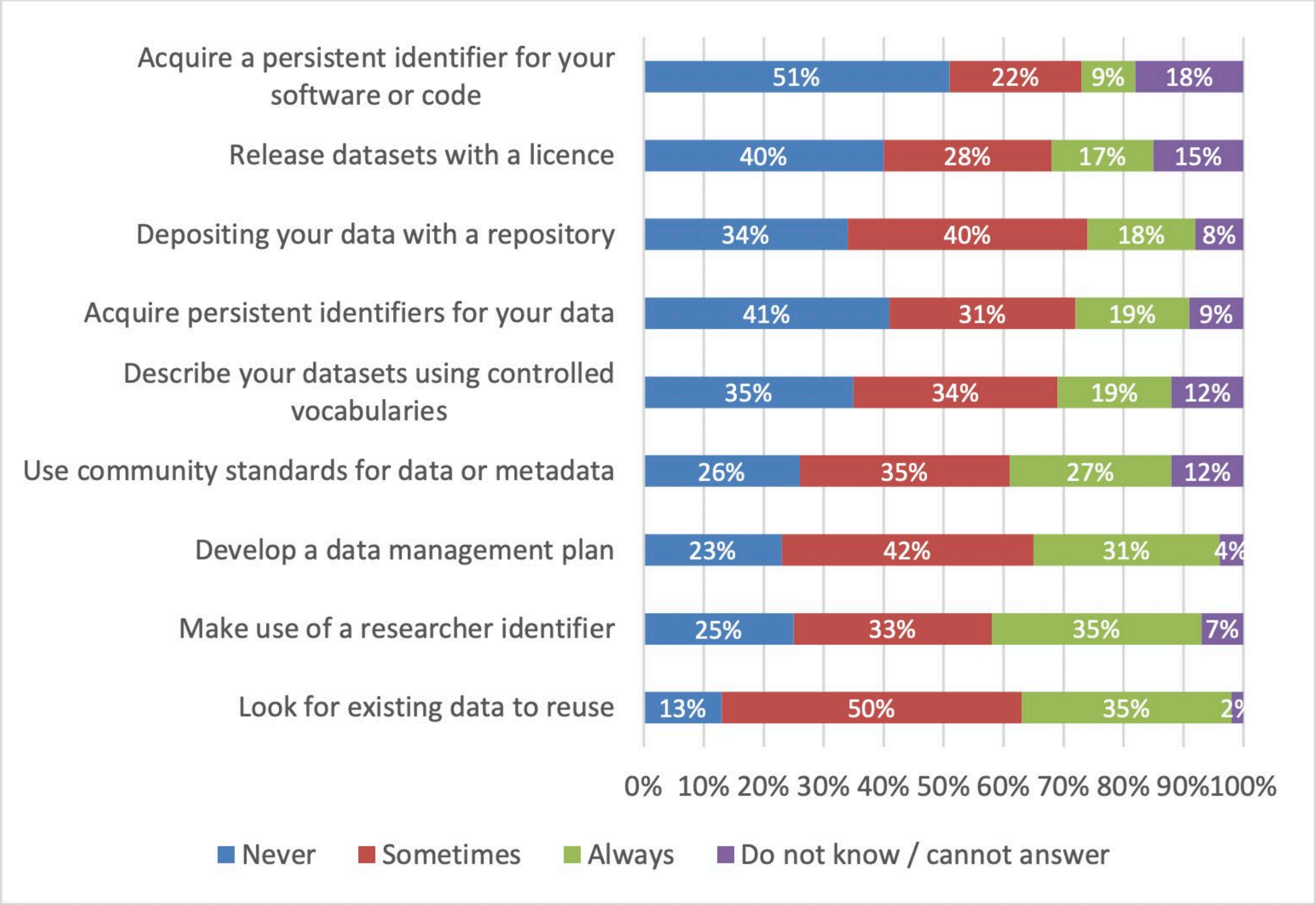
Colavissa et al, 2020

Resource availability with identifier



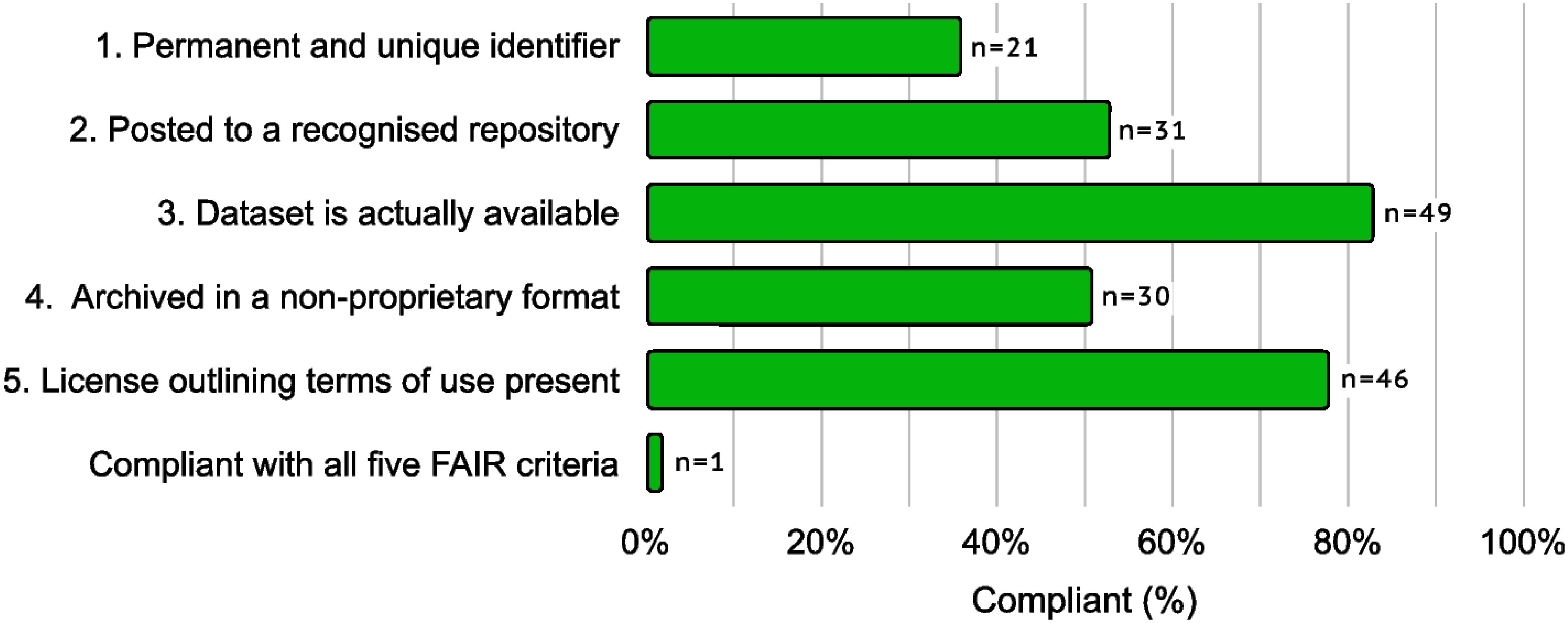
Federer, 2022

Frequency of carrying out specific FAIR-related activities



European Commission, 2022

FAIR assessment of 59 studies



Hamilton et al., 2022

Likely cost of not having FAIR research data

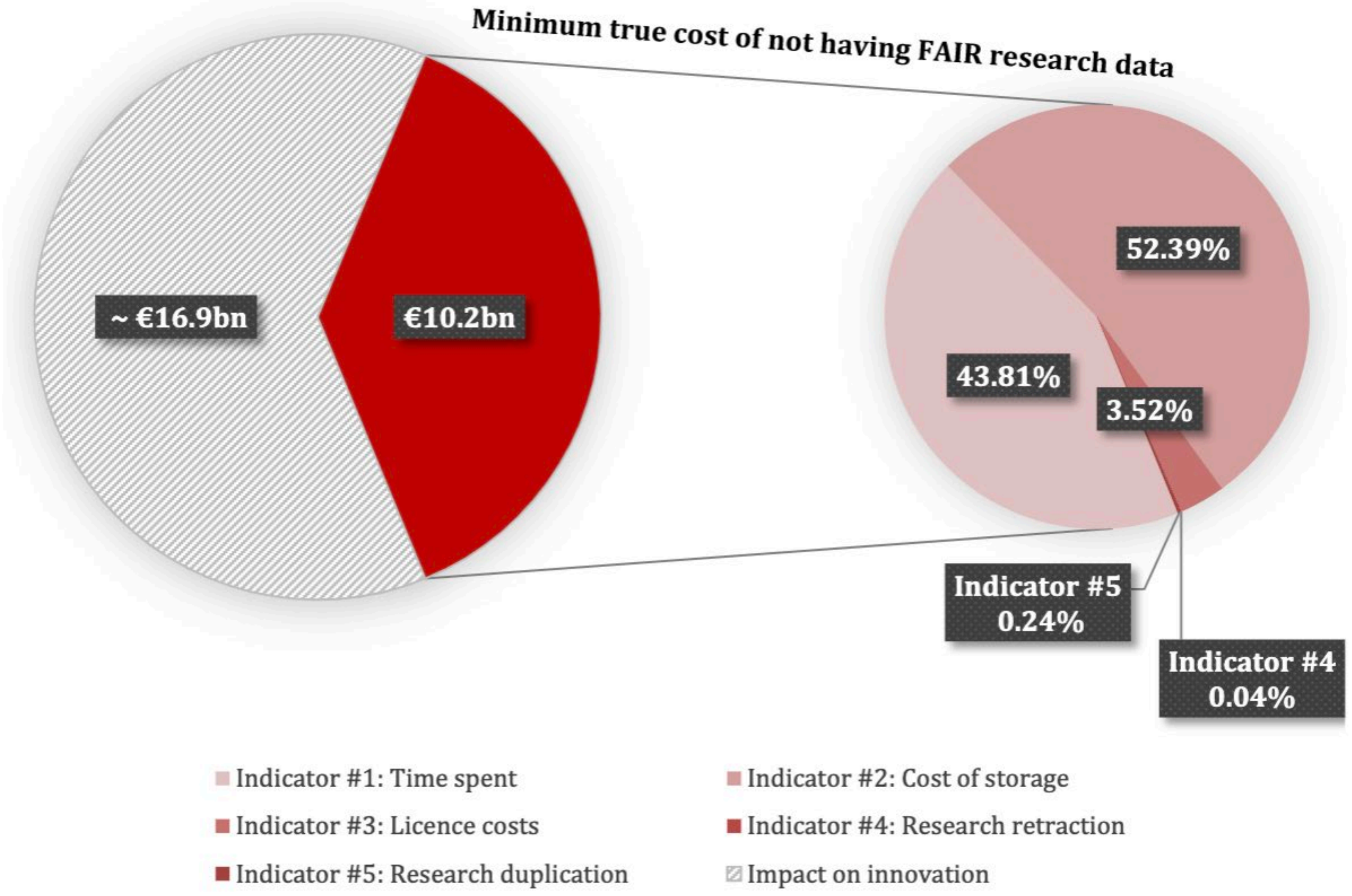
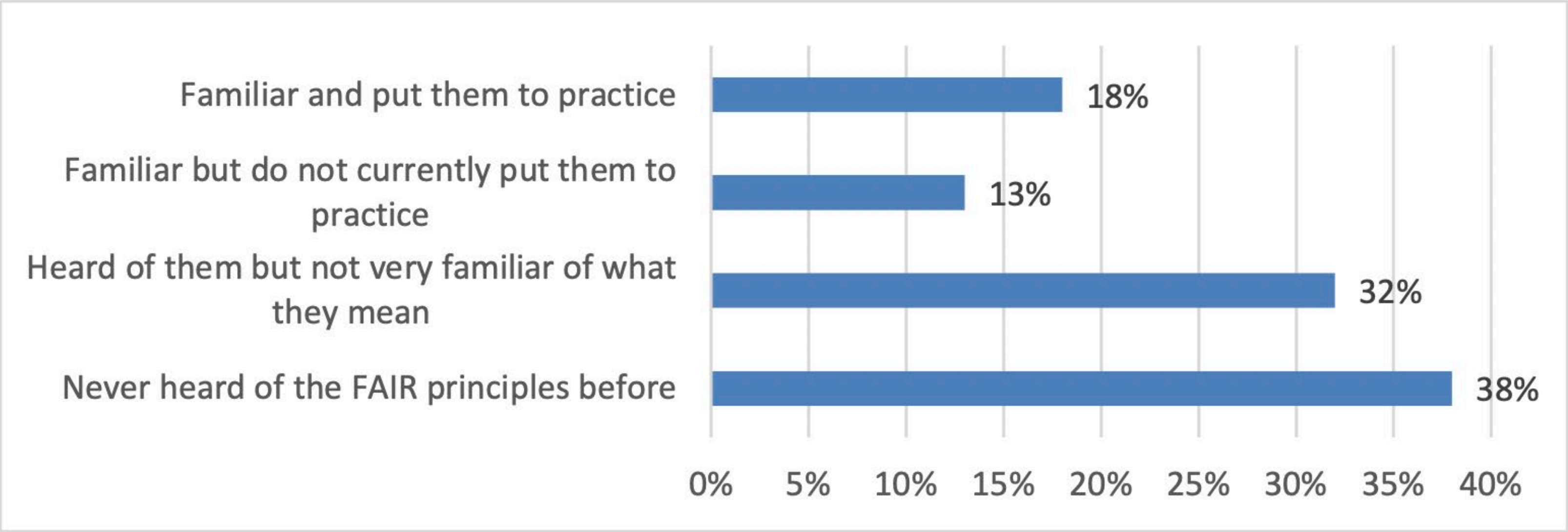


Figure 5: Cost breakdown

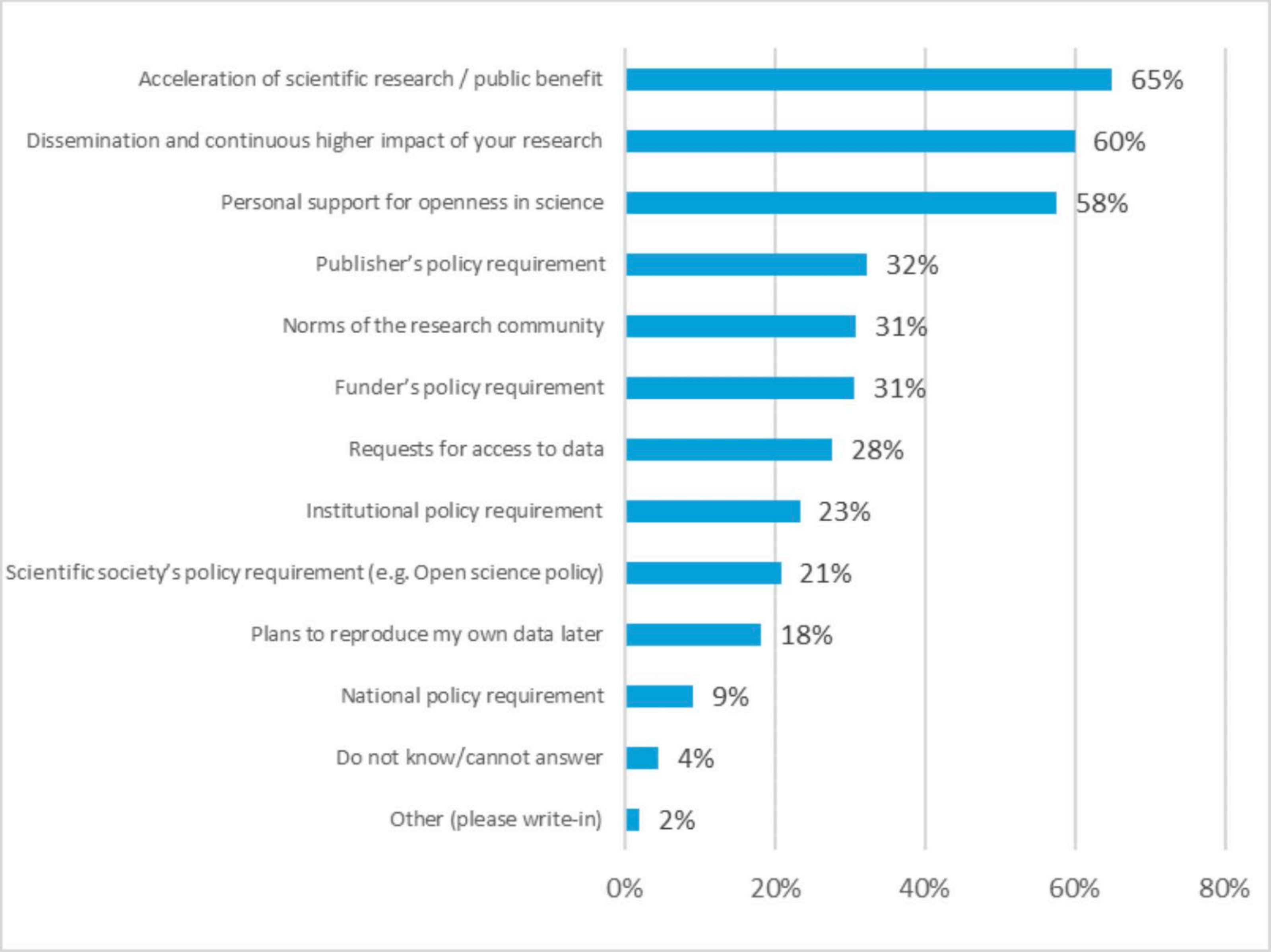
European Commission, 2019

Familiarity with the FAIR principles



European Commission, 2022

Why do researchers store research data in repositories?



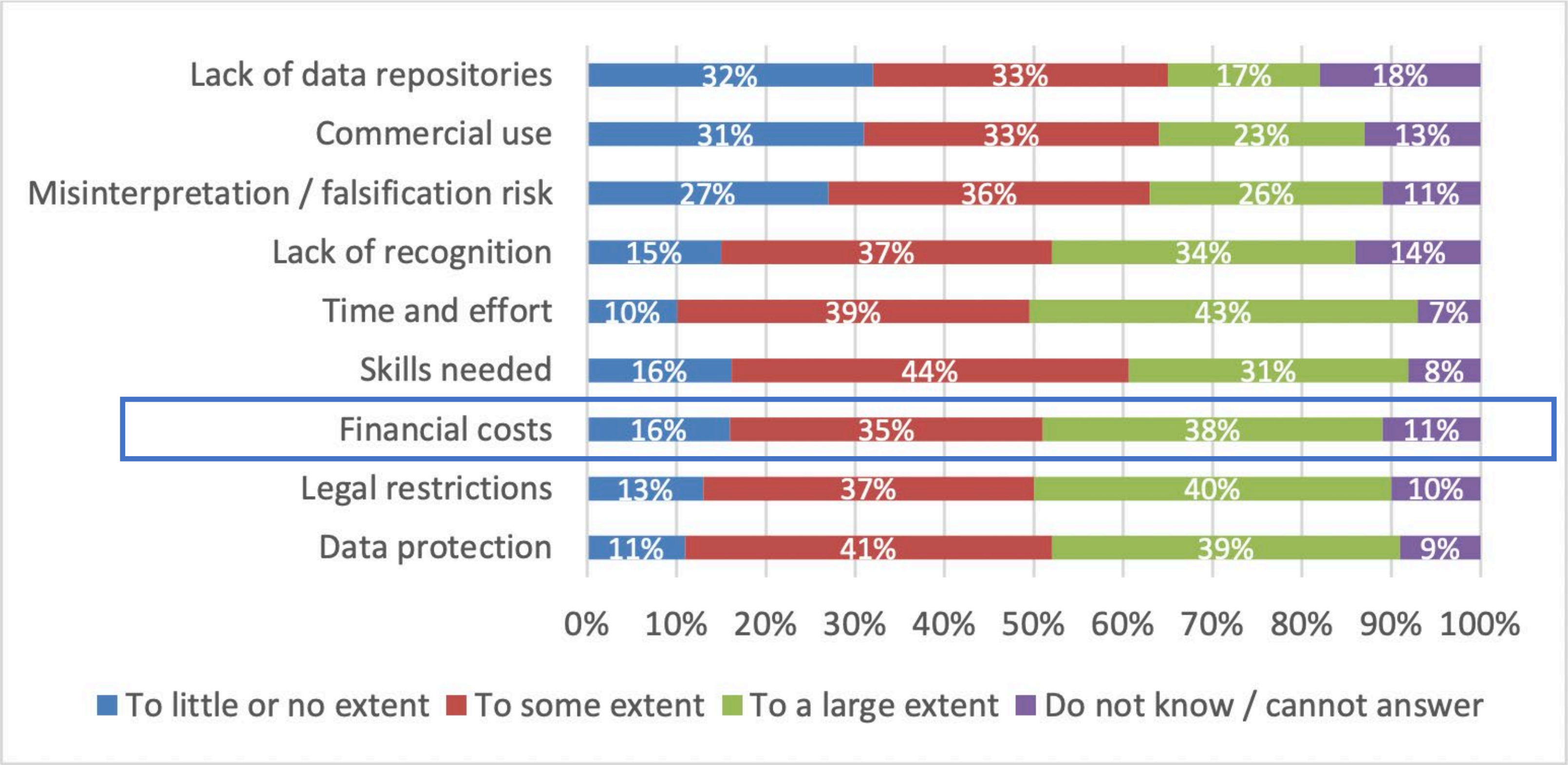
European Commission, 2022

Key barriers

	To a very large extent	To a large extent	To a moderate extent	To a small extent	To a very small extent	Not important in / applicable to my field of research
Pressure to publish for career advancement (N=1,245)	**30%**	**28%**	18%	10%	8%	6%
Lack of overall recognition given to research practices that promote reproducibility (N=1,243)	**20%**	**32%**	22%	11%	8%	8%
Extensive time and effort required to make research reproducible (i.e. describing, sharing, preserving data and methodologies, etc.) (N=1,267)	**16%**	**34%**	28%	10%	8%	5%
Lack of unified guidelines and commonly accepted standards for reproducible research practices (N=1,245)	16%	28%	26%	14%	9%	8%
Insufficient attention is paid to reproducibility-related topics during training and professional development (N=1,246)	15%	28%	29%	13%	8%	6%
Lack of access to the data used or generated by the original research (N=1,239)	17%	26%	23%	15%	11%	7%
Methods require tacit knowledge or particular technical expertise that makes them difficult for others to reproduce (N=1,205)	15%	28%	25%	13%	10%	9%
Focus on reproducibility is not incentivised by home research institutions (e.g. through hiring, tenure, promotion, etc.) (N=1,212)	16%	26%	23%	14%	12%	9%
Lack of journal policies promoting good reproducibility practices (N=1,215)	13%	25%	27%	15%	12%	8%
Research funders do not provide enough incentives to make research reproducible (N=1,218)	13%	23%	25%	15%	16%	9%
Selective reporting of results (including p-hacking / HARKing, lack of reporting of negative / null results) (N=1,058)	11%	25%	23%	15%	10%	16%
Legal or ethical restrictions (e.g. on data sharing) (N=1,264)	16%	19%	19%	14%	16%	16%
Original findings not robust enough (i.e. due to poor research design, statistical analysis, lack of verification or peer-review, etc.) (N=1,200)	10%	23%	28%	17%	13%	9%
Lack of publication of research protocols (N=1,198)	8%	23%	27%	19%	10%	13%
Lack of pre-registration of studies (N=1,058)	5%	15%	21%	20%	15%	24%

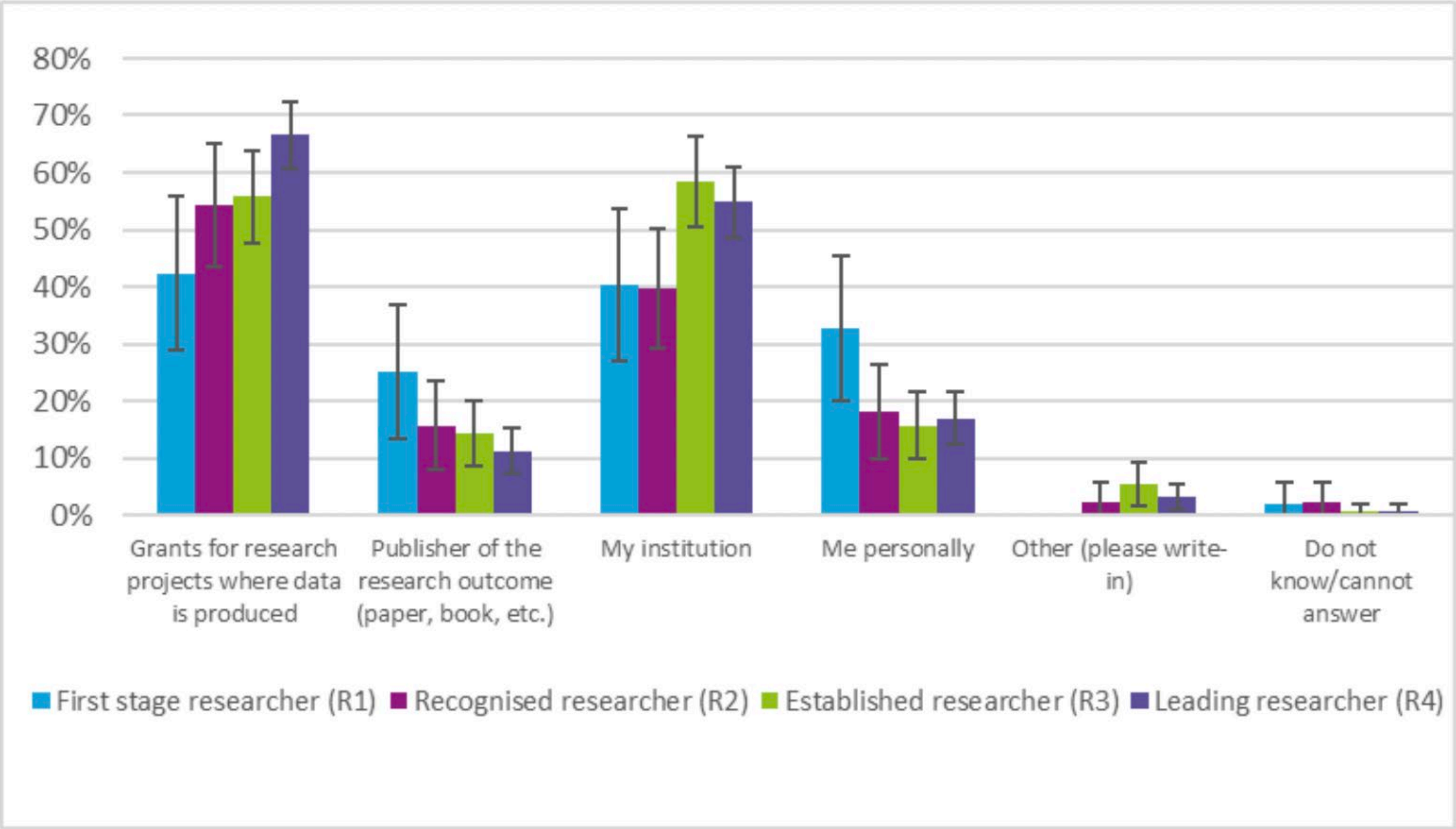
European Commission, 2022

Obstacles to the management and sharing of research data



European Commission, 2022

Ways in which research sharing costs were covered



European Commission, 2022

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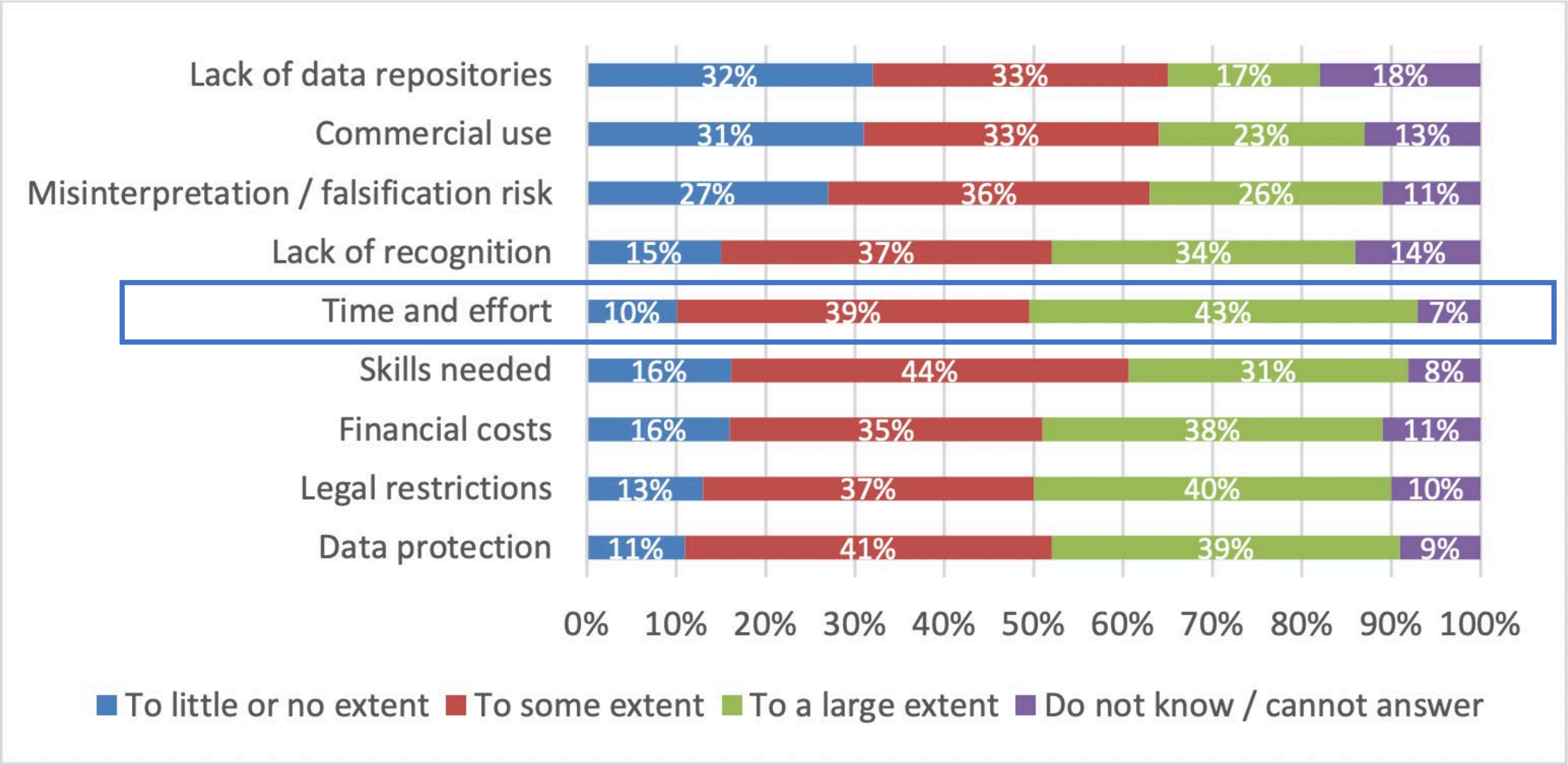
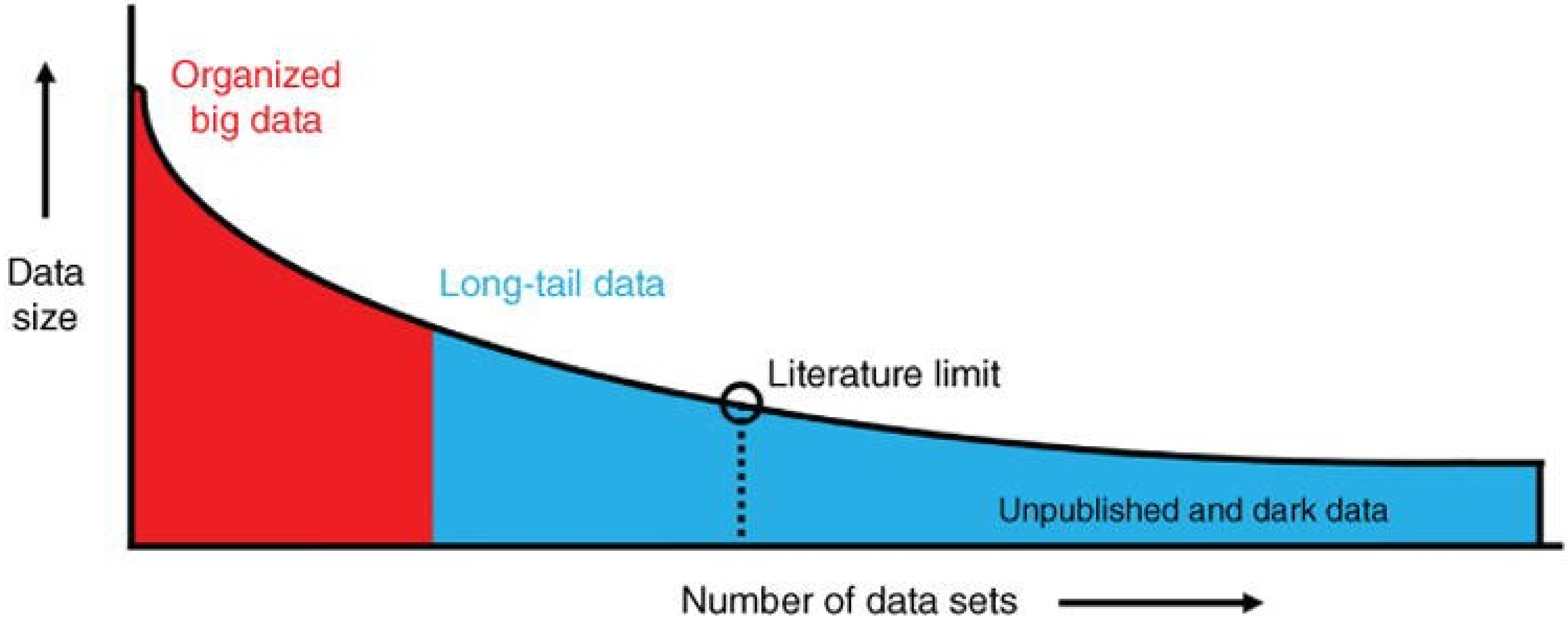


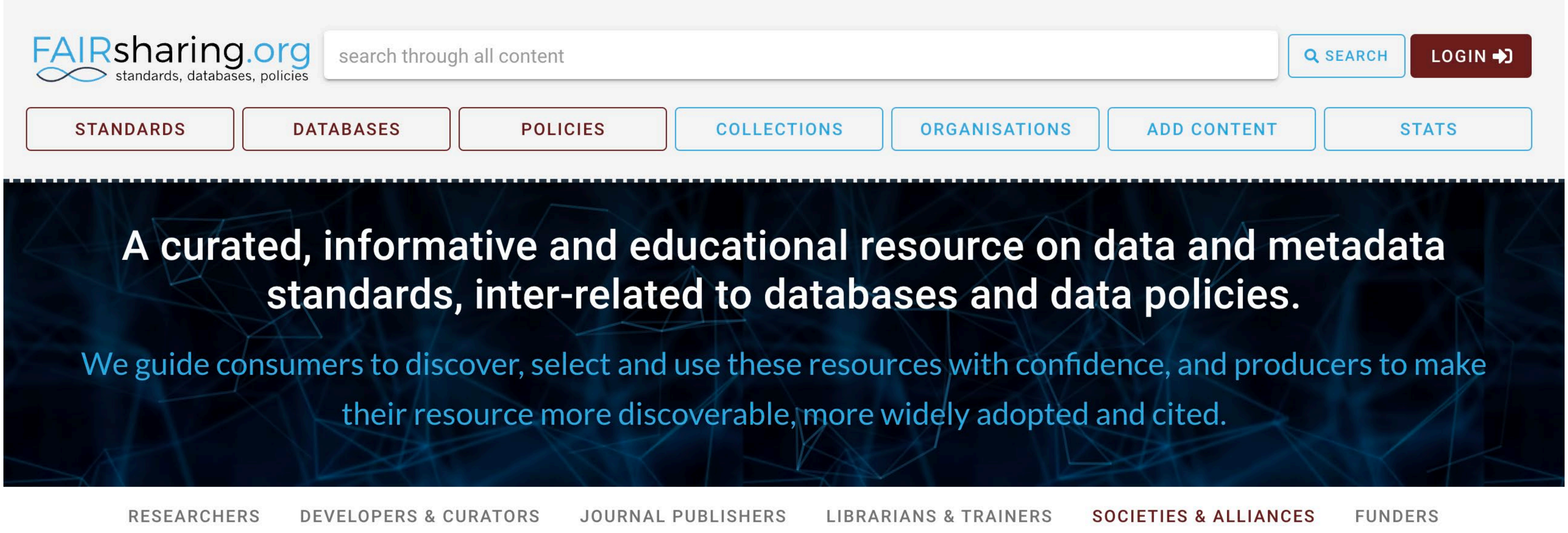
European Commission, 2022

The long tail of data



Ferguson et al., 2014

Many standards



Automate processes?

Automated metadata extraction: challenges and opportunities

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October 07 2022

Automated metadata annotation: What is and is not possible with machine learning

Mingfang Wu, Hans Brandhorst, Maria-Cristina Marinescu, Joaquim More Lopez, Margorie Hlava, Joseph Busch

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> Author and Article Information

Data Intelligence 1–17.
https://doi.org/10.1162/dint_a_00162 **Article history**

Experience: Automated Prediction of Experimental Metadata from Scientific Publications

STUTI NAYAK, AMRAPALI ZAVERI, PEDRO HERNANDEZ SERRANO, and MICHEL DUMONTIER, Institute of Data Science, Maastricht University, The Netherlands

Advancing smart building readiness: Automated metadata extraction using neural language processing methods☆,☆☆

David Waterworth[a,*], Subbu Sethuvenkatraman[b], Quan Z. Sheng[a]

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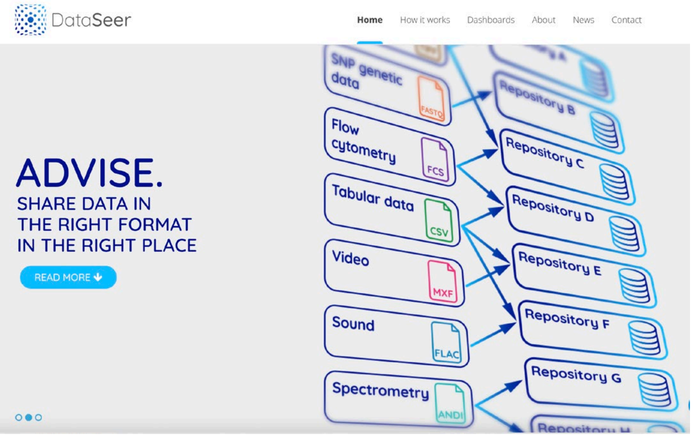

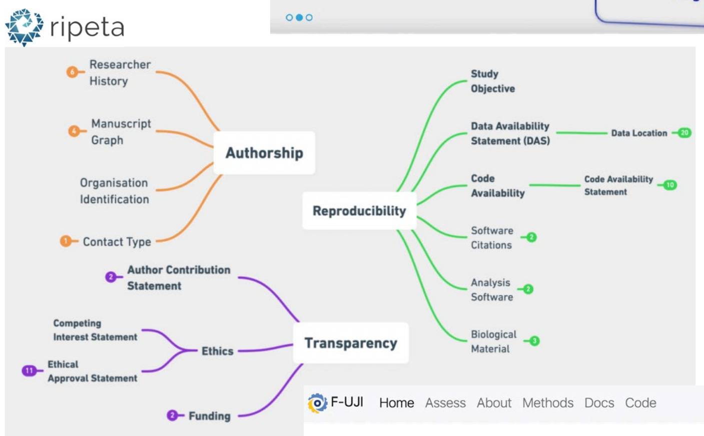

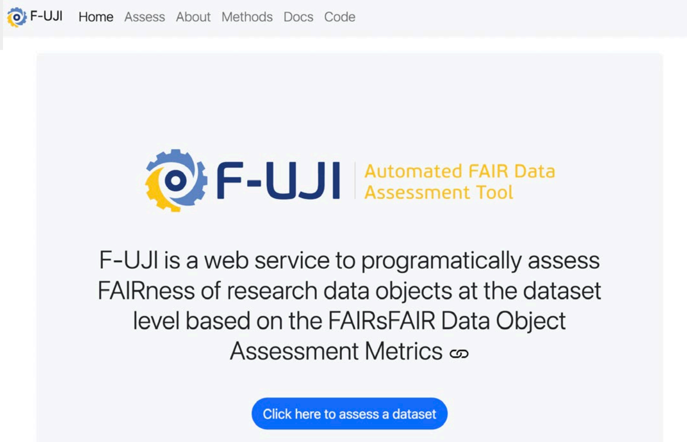

Summary

- FAIR data sharing in repositories helps with data transparency, reproducibility, reuse, and impact

- Researchers need help – unaware of FAIR practices and challenges in time, effort, and cost of data sharing

- The ‘long-tail’ of data complicates this further with many options

- Education, support, and workflows/tools to help automate process are potential opportunity areas

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