



Open Science in Researcher Evaluation

Open Science in the Swedish context

2025-Mar-20

SciLifeLab Training Hub in collab with SciLifeLab Data Center

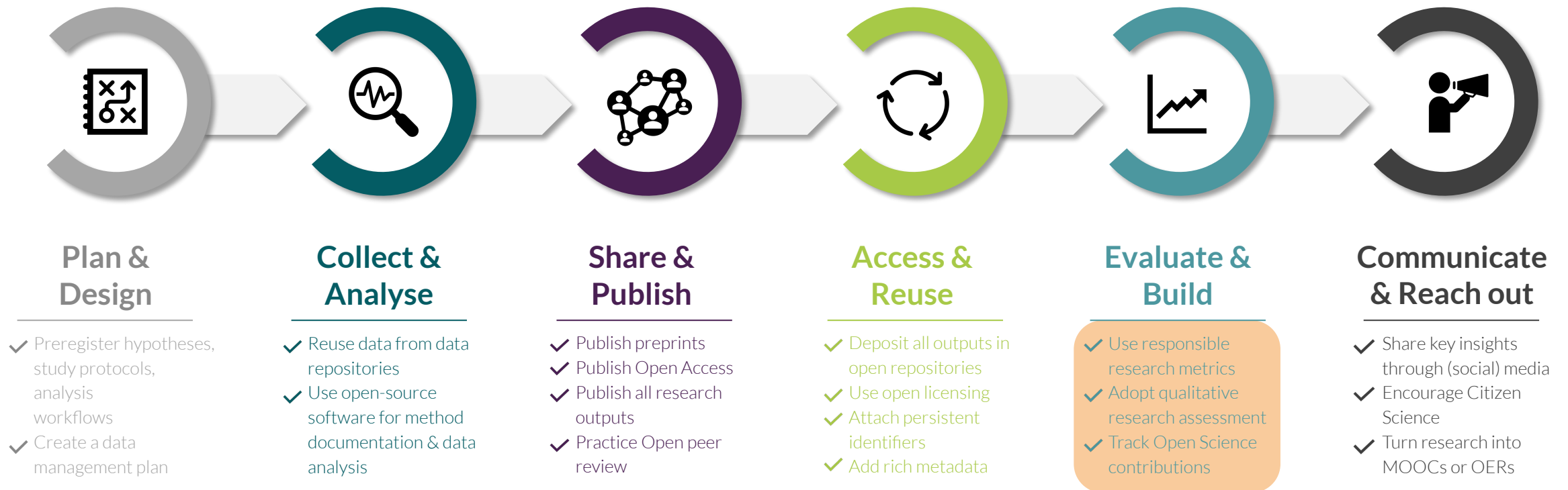
Joanna Sendecká, PhD 

in collaboration with Ineke Luijten, PhD 

How to implement Open Science



The Open Science workflow



Difficulty of Open Science implementation

*“For open science practices to be worthwhile for scholarly reputation, there would need to be **new methods of evaluating achievement** that **reward** Open Science practices.”*

Open Economics Guide, The Role of Open Science in the Evaluation of Research Work, CC BY 4.0

*“The transition to an open science system affects the entire research process. **The reward systems also need to be adjusted** in order to support and mirror the open research landscape.”*

Umeå University, Towards a new reward system for open science, Sanna Isabel Ulfsparre, CC BY 4.0

*“Open Science will never be achieved unless accompanied by a **change** in the way researchers are **evaluated**. Without this, no researcher, will take the proven risk of departing from the old principles that continue to paralyse scientific communications.”*

European University Association, 2019 EUA Open Science and Access Survey results, CC BY-NC 4.0

Research evaluation - current practices



Universities

Researcher evaluation purposes:

- Researcher career assessment
- Research unit performance
- Allocation of research funding

Funders

Researcher evaluation purposes:

- Determining research productivity
- Assessing scientific excellence
- Track record of funding success

Research evaluation - current practices



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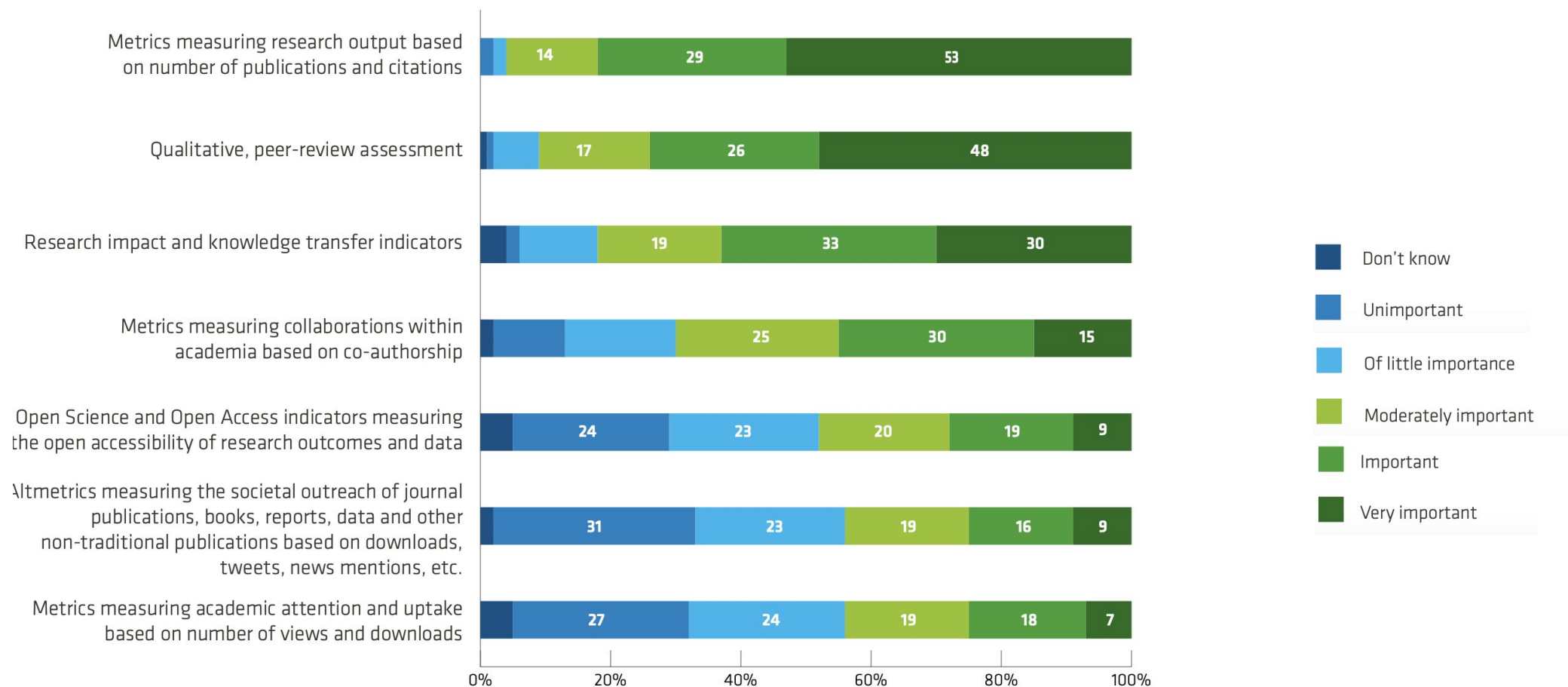
How do they measure career, performance, productivity, success and excellence?

Research evaluation - current practices



Figure 10 – Evaluation of academic activities for research careers

Based on survey question 8, ranking question (cf. Annex 1). Number of respondents: 194-195/197



Research evaluation - current practices



Funders



A list of **all works published in peer-reviewed journals** and with the ten most significant publications highlighted. For scientific areas where it is applicable, using Web of Science, Scopus or Google Scholar, an **h-index** and the **number of publications and citations the h-index** is based on must be specified.



Bibliometrics shall be used with caution in the review, and only as part of **an overall assessment of the merits** carried out by reviewers with expertise in the area in question. **Bibliometrical data** gathered in conjunction with the application shall be relevant to the research area and the grant form the call relates to.



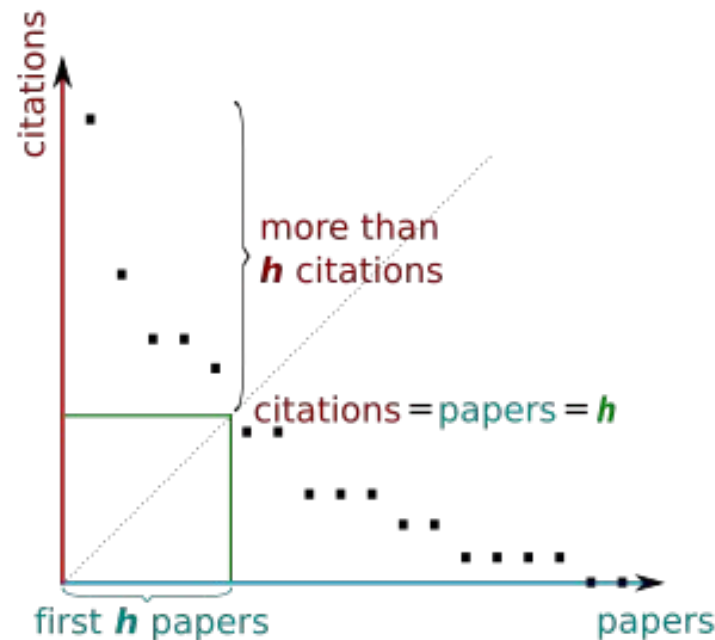
No publicly available information about procedures for evaluation

Indexes - convenient but problematic



The **h-index** is an author-level metric that measures both the **productivity and citation impact of the publications**, initially used for an individual scientist or scholar. (...) The index is based on the set of the scientist's **most cited papers** and the number of citations that they have received in other publications.

E.g. **h-index = 6** means 6 papers were cited at least 6 times

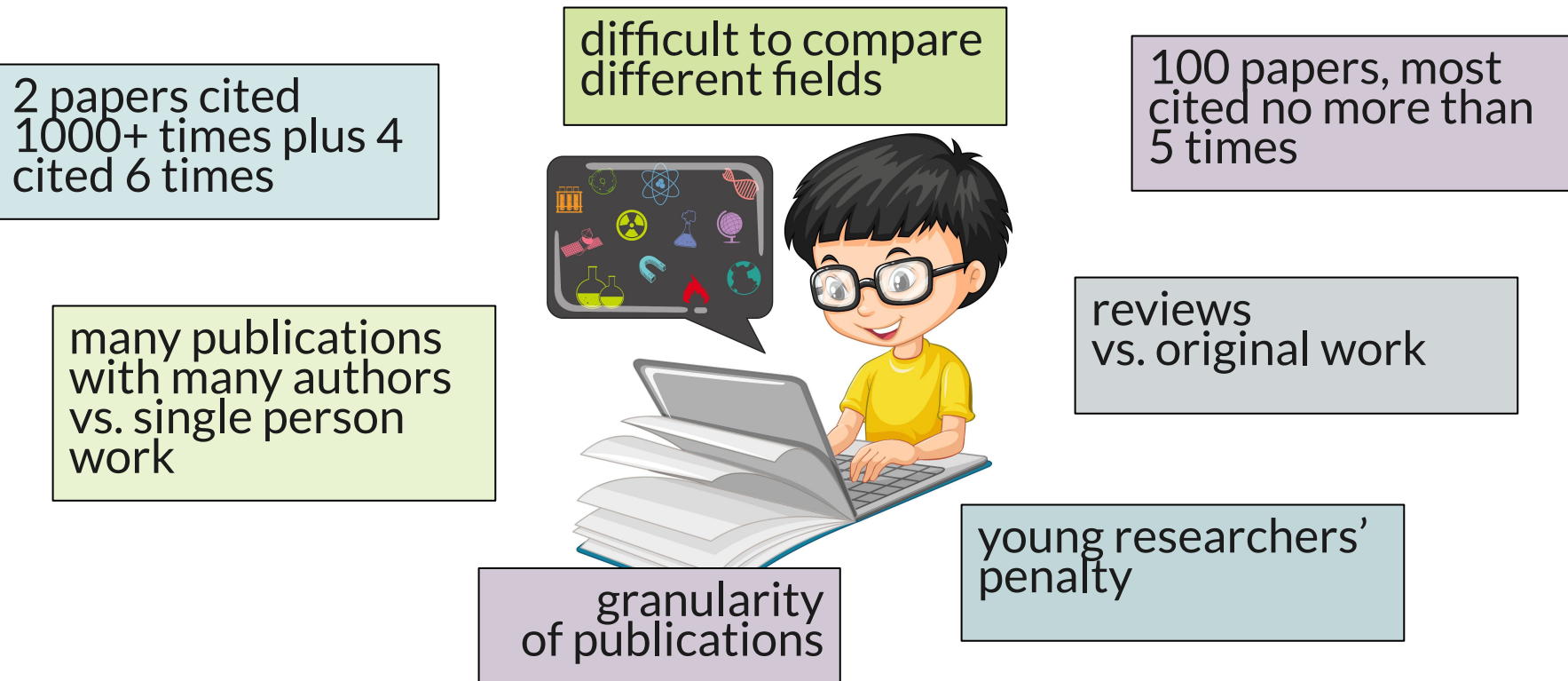


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Indexes - convenient but problematic



Google Scholar's h-core, h-median and more
- also based only on most cited papers

Google Scholar Metrics

Available Metrics

The **h-index** of a publication is the largest number h such that at least h articles in that publication were cited at least h times each. For example, a publication with five articles cited by, respectively, 17, 9, 6, 3, and 2, has the h-index of 3.

The **h-core** of a publication is a set of top cited h articles from the publication. These are the articles that the h-index is based on. For example, the publication above has the h-core with three articles, those cited by 17, 9, and 6.

The **h-median** of a publication is the median of the citation counts in its h-core. For example, the h-median of the publication above is 9. The h-median is a measure of the distribution of citations to the articles in the h-core.

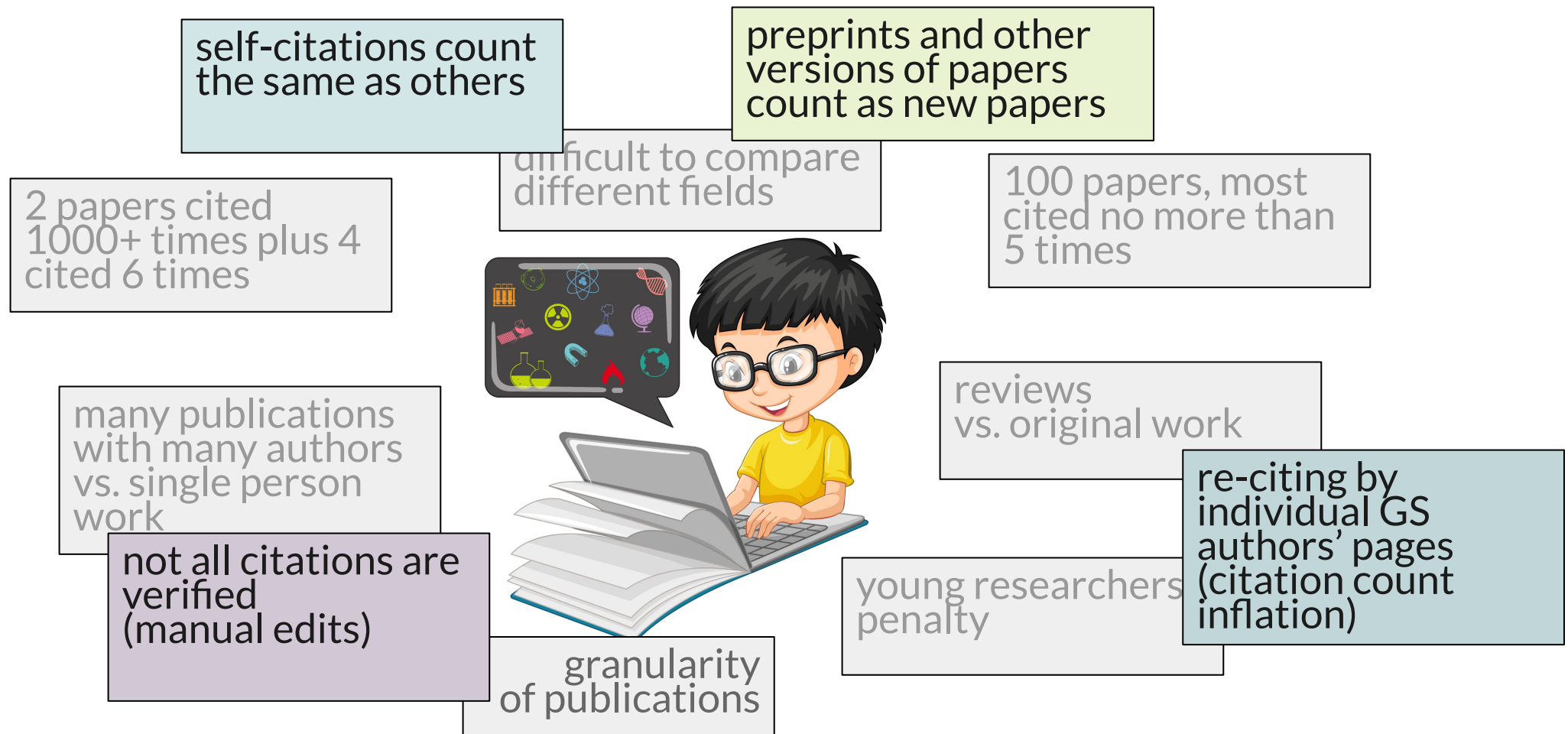
Finally, the **h5-index**, **h5-core**, and **h5-median** of a publication are, respectively, the h-index, h-core, and h-median of only those of its articles that were published in the last five complete calendar years.

We display the h5-index and the h5-median for each included publication. We also display an entire h5-core of its articles, along with their citation counts, so that you can see which articles contribute to the h5-index. And there's more! Click on the citation count for any article in the h5-core to see who cited it.

Indexes - convenient but problematic



Google Scholar's h-core, h-median and more
- also based only on most cited papers



Is h-index even true?



Larry Richardson

Northwestern University

Verified email at u.northwestern.edu

[representation theory](#) [mathematics](#) [pde](#)



Cited by

	All	Since 2019
Citations	132	132
h-index	11	11
i10-index	11	11

TITLE

CITED BY

YEAR

[Curves over isometries](#)

12 2024

L Richardson

Dynamics and Conformal Geometry 4, 50-60

[Functors of natural homeomorphisms and questions of regularity](#)

12 2024

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Acta Numerologica Vol 4 (1)

[Admissibility methods in representation theory](#)

12 2023

L Richardson

Journal of Representation Theory Vol 20 (8)

[Isometries of arithmetic subalgebras and Desargues's conjecture](#)

12 2023

L Richardson

International Journal of Real Analysis 10, 8-16

Research evaluation - Change needed



Larry Richardson

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NEWS | SCIENTIFIC COMMUNITY

How easy is it to fudge your scientific rank? Meet Larry, the world's most cited cat

“Exercise in absurdity” reveals flaws in Google Scholar’s productivity metrics

31 JUL 2024 • 4:50 PM ET • BY [CHRISTIE WILCOX](#)

Christie Wilcox (2024) How easy is it to fudge your scientific rank?

Science [10.1126/science.zl99qni](https://doi.org/10.1126/science.zl99qni)

Research evaluation - change requested



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Impact factor: outdated artefact or stepping-stone to journal certification?

Published: 24 November 2011
Volume 92, pages 211–238, (2012) [Cite this article](#)

<https://doi.org/10.1007/s11192-011-0561-0>

nature

Explore content About the journal Publish with us

[nature](#) > [editorials](#) > article

Editorial | Published: 22 June 2005

Not-so-deep impact

[Nature](#) 435, 1003–1004 (2005) | [Cite this article](#)

20k Accesses | 149 Altmetric [Metrics](#)

Research assessment rests too heavily on the inflated status of the impact factor.

<https://doi.org/10.1038/4351003b>

thebmj covid-19 Research Education News & Views Campaigns

Education And Debate

Why the Impact factor of journals should not be used for evaluating research

BMJ 1997 ; 314 doi: <https://doi.org/10.1136/bmj.314.7079.497> (Published 15 February 1997)
Cite this as: BMJ 1997;314:497

Article Related content Metrics Responses

Per O Seglen, professor

Author affiliations

Accepted 9 January 1997

<https://doi.org/10.1136/bmj.314.7079.497>



EDITORIAL | J Cell Biol. 2008 Jan 28;180(2):254–255. doi: [10.1083/jcb.200801036](https://doi.org/10.1083/jcb.200801036)

Irreproducible results: a response to Thomson Scientific

[Mike Rossner](#)¹, [Heather Van Epps](#)², [Emma Hill](#)³

Author information Copyright and License information

PMCID: PMC2213574 PMID: [18192491](#)

<https://doi.org/10.1083/jcb.200801036>

JCB Journal of Cell Biology Articles Reviews & Opinion Col

Editorial | December 17 2007

Show me the data

Mike Rossner, Heather Van Epps, Emma Hill

+ Author and Article Information



J Cell Biol (2007) 179 (6): 1091–1092. <https://doi.org/10.1083/jcb.200711140>

Standard View PDF Share Tools

The integrity of data, and transparency about their acquisition, are vital to science. The impact factor data that are gathered and sold by Thomson Scientific (formerly the Institute of Scientific Information, or ISI) have a strong influence on the scientific community, affecting decisions on where to publish, whom to promote or hire (1), the success of grant applications (2), and even salary bonuses (3). Yet, members of the community seem to have little understanding of how impact factors are determined, and, to our knowledge, no one has independently audited the underlying data to validate their reliability.

<https://doi.org/10.1083/jcb.200711140>

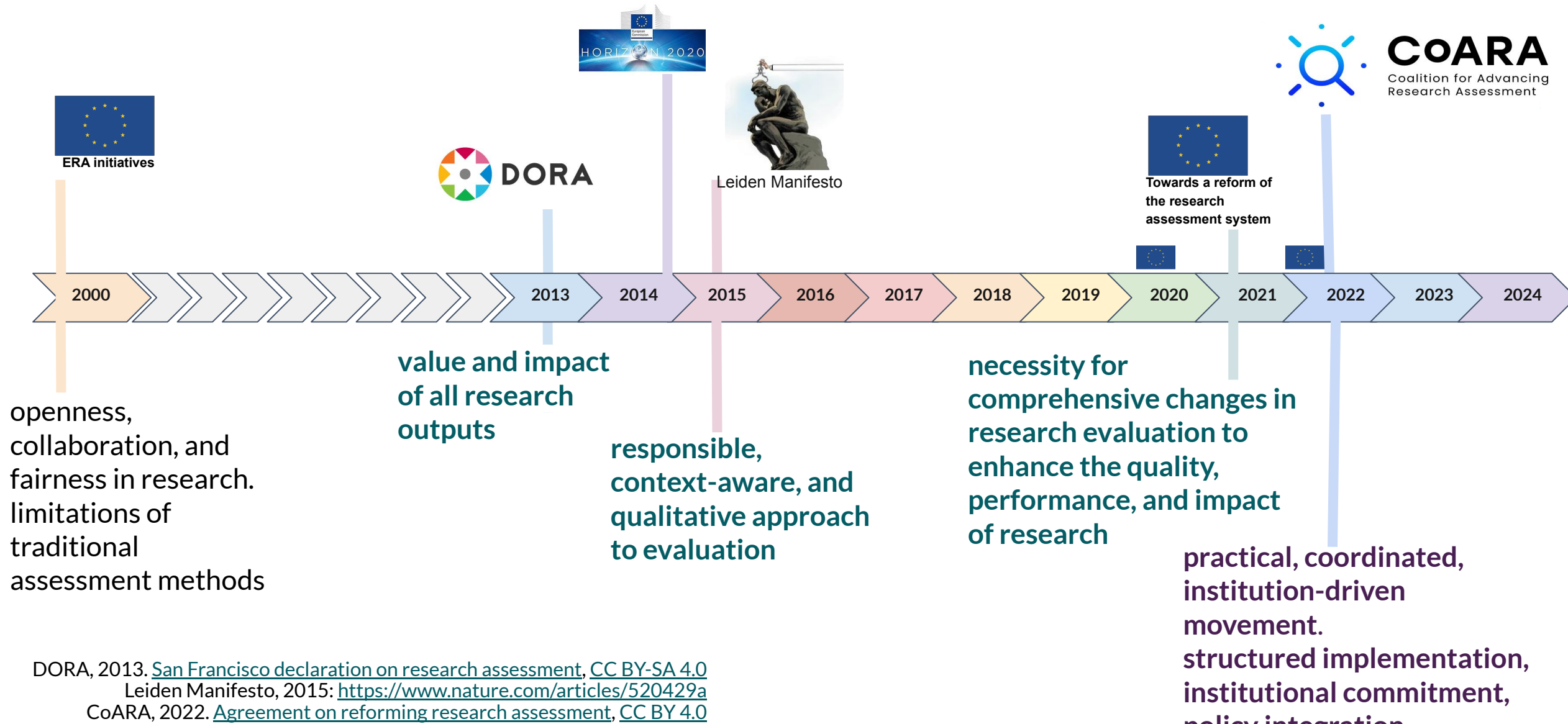
Research evaluation - change requested



How does research evaluation based on bibliometrics hinder Open Science?

- encourages publishing in **paywalled journals** because of their high impact factors, despite the availability of open access alternatives
- generates excessive attention to rankings that **hinders collaboration**
- waste efforts, time and resources through the duplication of work as 'negative' findings go largely **unreported**
- promotes **quantity and speed** at the expense of quality and rigour
- lead to **risk-adversity** because taking risks may reduce the chances of publication
- lead to the emergence of **predatory journals** and conferences

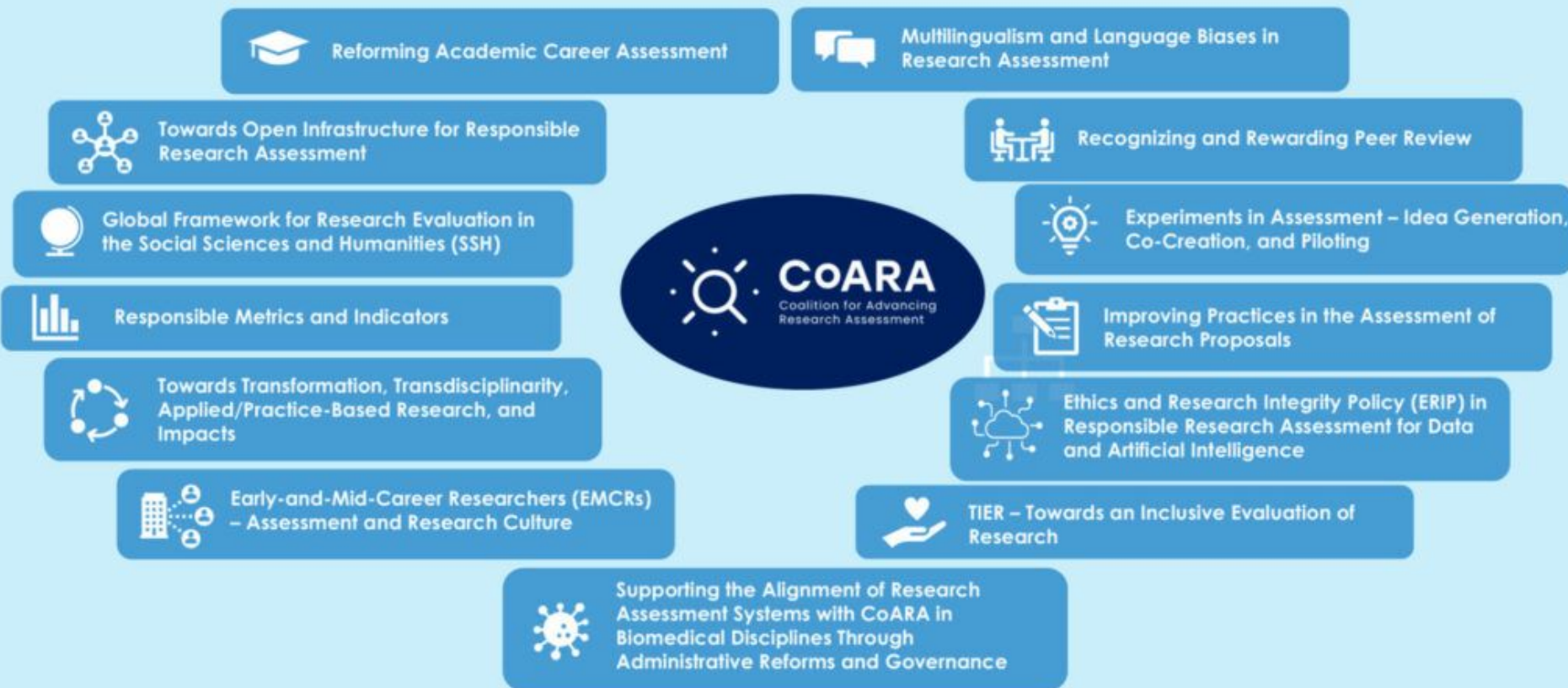
Research evaluation - Change coming



CoARA - Change coming



CoARA Working Groups



Open Infrastructures
Multilingualism
Innovative Assessments
Career Assessment
Diverse academic roles
Diverse initiatives
Responsible Metrics
Proposal Evaluation
Ethics in AI
Transdisciplinarity
Peer Review Recognition

Research evaluation – Change is here



FIGURE 9 The inclusion of open science as part of funding requirements for funded projects?

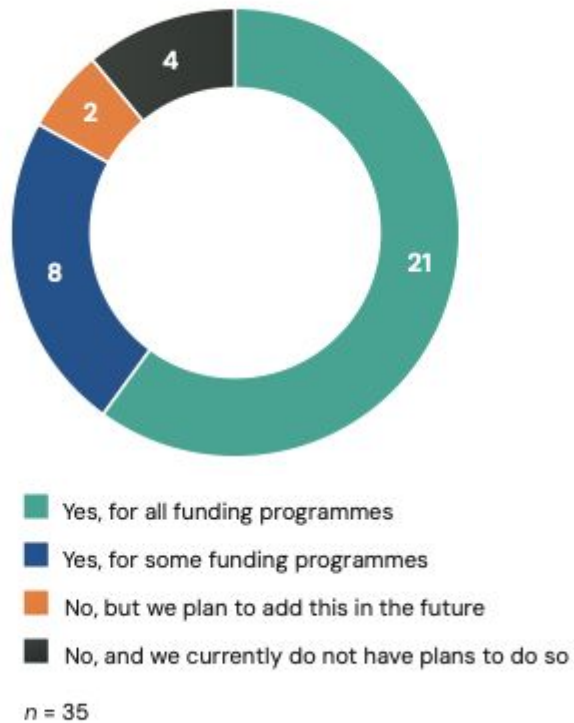
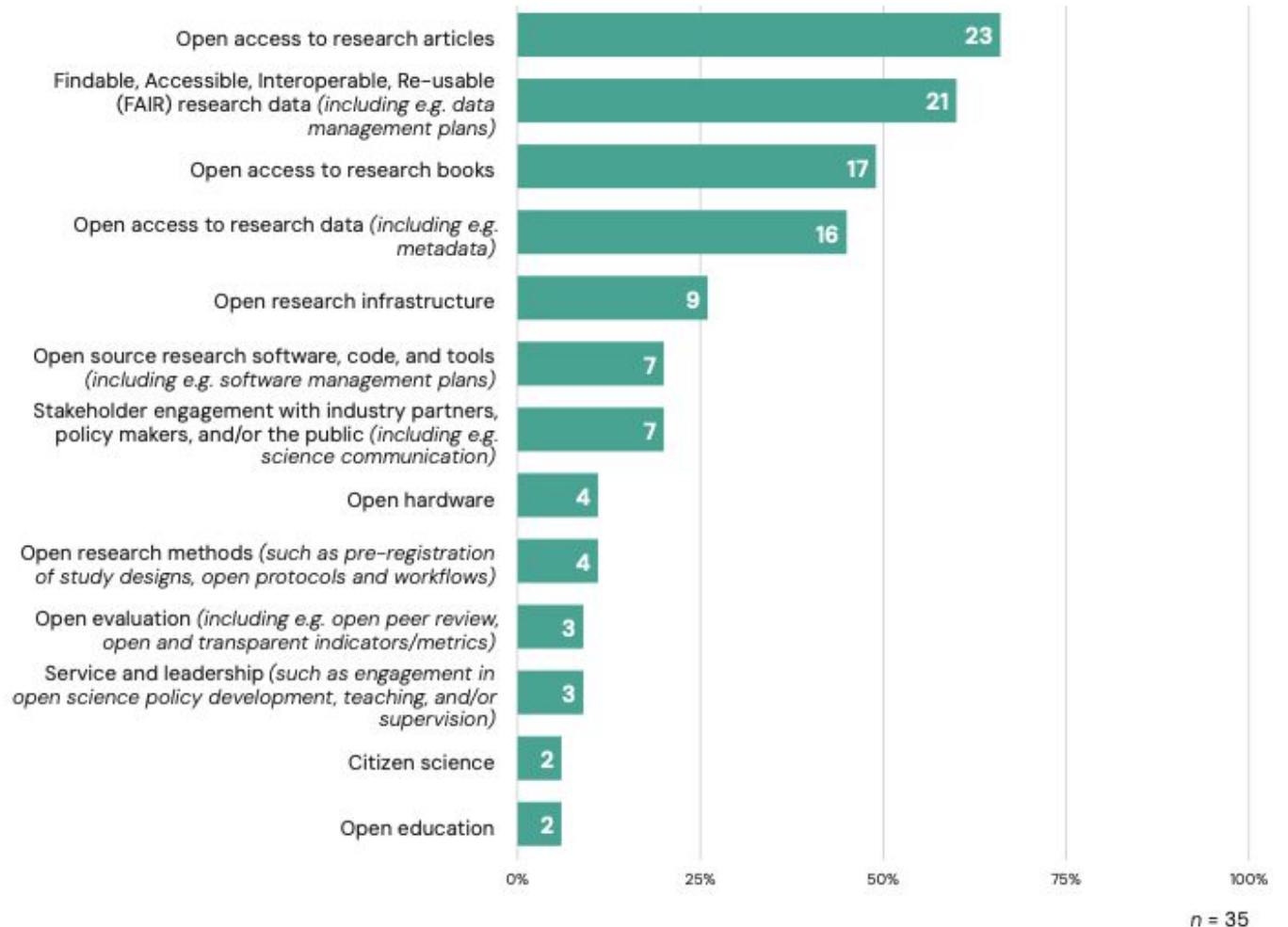


FIGURE 10 Elements of open science included as part of funding requirements for funded projects? (multiple choice)

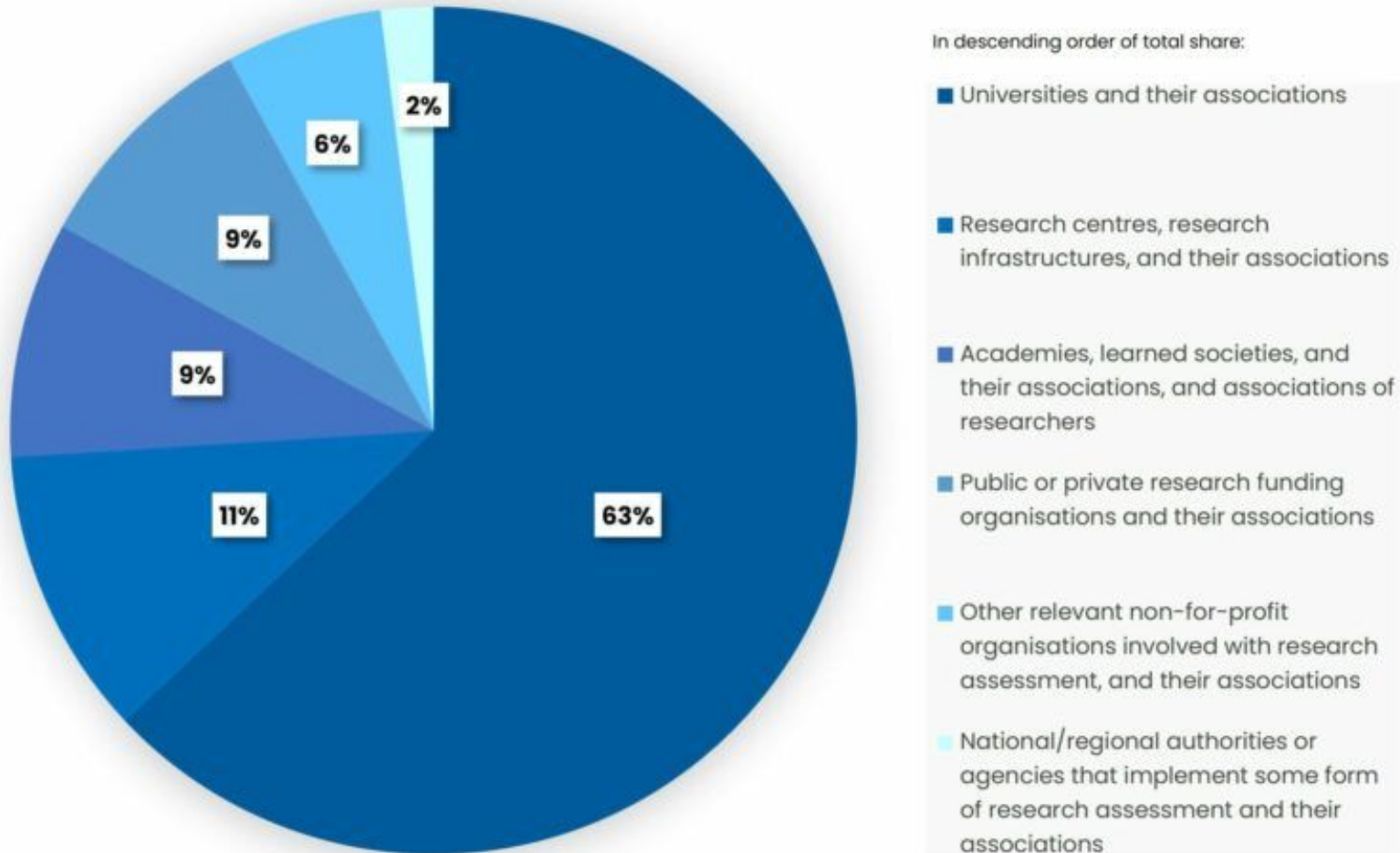


CoARA today



November 19, 2024

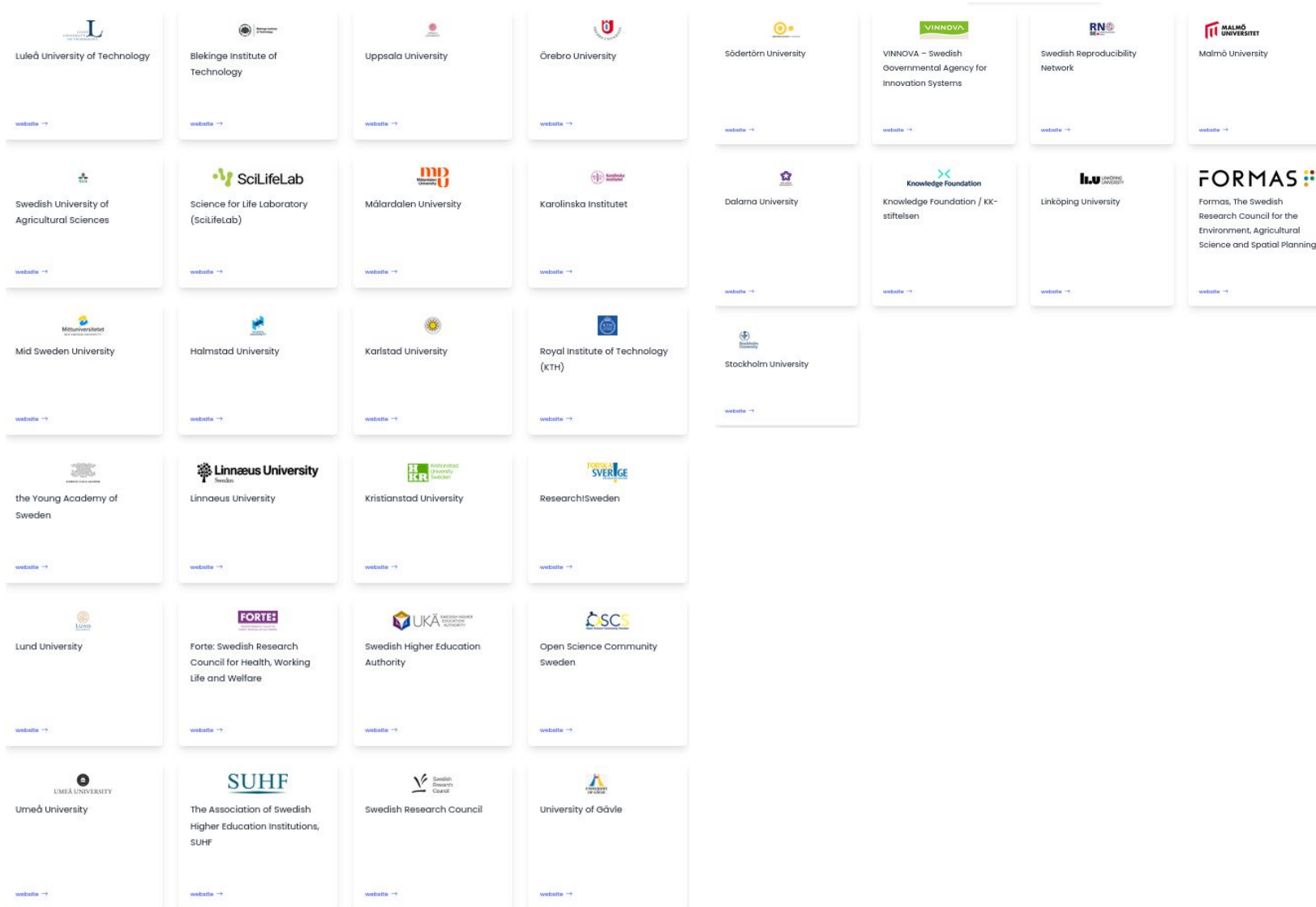
Distribution of CoARA membership by type of organisation



700 MEMBER MILESTONE

- 13 active Working Groups
- 16 active National Chapters

CoARA in Sweden



33 signatories

- universities
- funders
- organisations

<https://coara.eu/working-groups/national-chapters/coara-national-chapter-sweden/>

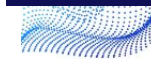
CoARA in Sweden



Key objectives:

- **Develop Common Standards:** Collaborate at the national level to identify and implement unified standards for assessing research, **moving beyond traditional metrics like publication counts and citation numbers**
- **Promote Experience Sharing:** Encourage the exchange of experiences and best practices among Swedish universities and research institutions to facilitate the **adoption of new assessment models**
- **Engage Major Funders:** Work towards involving major funding bodies in the reform process to **ensure comprehensive changes in research assessment that encompass both academic and societal contributions**
- **Contribute to the CoARA Community:** Actively **share successful examples** and insights from the Swedish context with the broader CoARA community to **support global efforts in research assessment reform**

CoARA National Chapter: Sweden



Annex III - Application template – Call for National Chapters

1. Country*:	SWEDEN
2. Contact details of the main National Chapter proposer*:	Name: Jan-Ingvar Jönsson, professor, vice-chancellor Linköping University The Association of Swedish Higher Education Institutions, SUHF Tryckerigatan 8, 111 28 Stockholm, Sweden E-mail: rektor@liu.se
3. List member organisations proposing the National Chapter*:	The Association of Swedish Higher Education Institutions, SUHF Affiliated Universities as signatories of CoARA (see below, item 8) National research councils as listed below
4. Short description of the mission and objectives of the group, and of how it fits with the overall CoARA vision*: 300 characters max.	This proposal is a major effort between SUHF, the Association of Swedish Higher Education Institutions, and national research funders in Sweden to work together to find common grounds on the definitions and criteria how to assess research in the future. While SUHF and the Swedish Research Council (SRC) have since 2021 arranged annual workshops where the whole sector have been involved in discussions on defining the major obstacles, there is now an emergent need to move forward. In 2022, SUHF appointed a working group with the task of developing a national framework for merit assessment at Swedish higher education institutions, triggered also by the call for an updated Open Science strategy. Since this work is not only focusing on research merits but university teachers and researchers' full-ranged achievements, major funders are not actively participating in this work. Thus, there is a need for parallel work focusing more clearly on research merits and promoting the exchange of experiences and models for successful management and implementation of new standards between universities and funders . Therefore, Swedish signatories of CoARA have agreed to work at the national level to identifying common standards for assessment of research. We see advantages in gathering the overall national work together with the National chapter, and we intend to actively contribute our on-going work and implemented "good examples" with the whole CoARA family .
5. Expected impact notably expected adoption and implementation scenarios*: 2000 characters max.	There is an increasing awareness among Swedish higher education institutions and major funders that current standards for assessing research merits have major limitations and is not fully reflecting how science is performed today and how research output is disseminated. By gathering universities and funders together with other stakeholders within the Swedish National Chapter, the whole research sector will benefit by finding common understanding and grounds on how to assess research merits in the future. The progress of the national work will be reported and shared openly with the CoARA community. While we clearly respect the work of individual organisations as well as the autonomy between higher education institutions, it is expected that participating Swedish actors will during 2024 start planning, promoting, and sharing ideas and work towards the implementation of new standards and models. The overall goal is that most, if not all, participants have agreed on some future standards of useful criteria for assessing researchers' full competences and more complete range of academic and societal contributions within a period of three years from now.

<https://coara.eu/working-groups/national-chapters/coara-national-chapter-sweden/>

CoARA in Sweden and SciLifeLab



Working groups

1. Research applications at national level, individual and environmental support

Coco Norén, Uppsala University

2. Good practice in the evaluation of researchers, research training and career paths

Adina L. Feldman, KI

3. Responsible bibliometrics

Katrine Riklund, Umeå University

4. Incentives for open science

Gustav Nilsson, SweRN/KI

5. Merit values in collaboration and utilization

Margareta Friman, Karlstad university

**SciLifeLab participates in
National-level working
groups**

CoARA in Sweden and SciLifeLab



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2025-02-03

1 (5)

CoARA Action Plan for SciLifeLab: A Path Towards Recognising Diverse Contributions to Research Through Open Science and the FAIR Principles

About SciLifeLab

SciLifeLab (www.scilifelab.se) is a hub for life science research in Sweden and a collaboration between Swedish universities. Everyone at SciLifeLab is employed at one of the partner universities. Since 2013, SciLifeLab has been assigned by the Swedish government to operate national infrastructure, to provide cutting-edge life science technologies and -expertise to Swedish researchers, and to be a top international centre for research in health- and environment sciences.

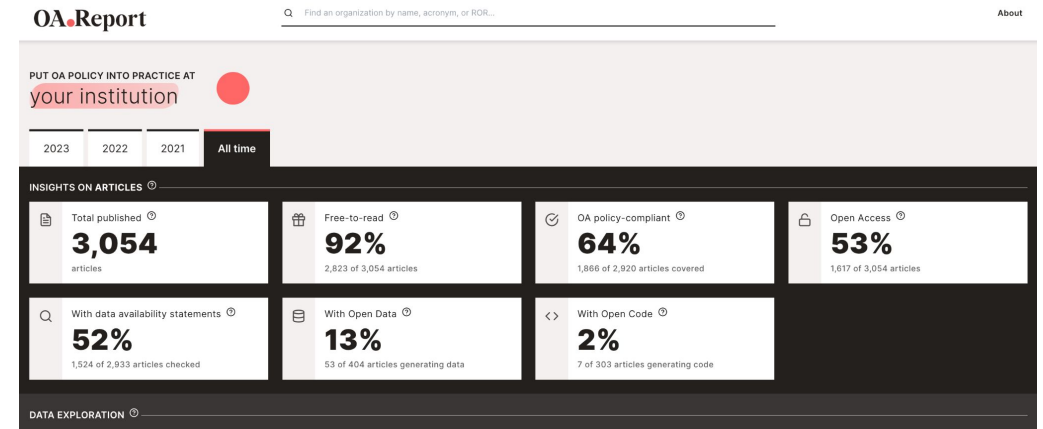
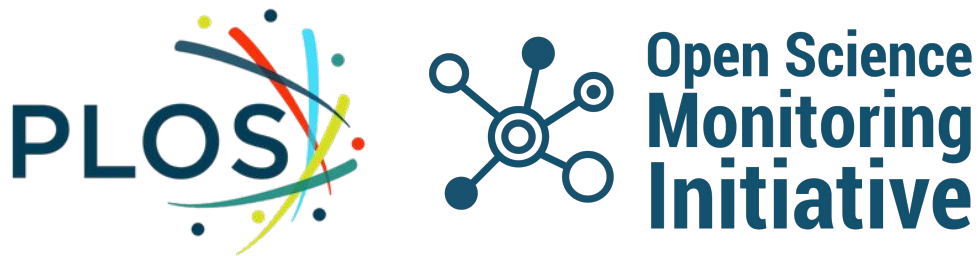
Introduction

SciLifeLab [announced](#) that it had joined CoARA on 23 February 2024 with the goals of advancing research assessment practices and open science within the organisation. while



Monitoring Open Science and FAIR

- Dashboard that tracks SciLifeLab open and FAIR research outputs (publications, data, software, protocols, etc.)
- Mining and indexing service to improve discovery of these outputs (e.g., Europe PMC)



Europe PMC About Tools Developers Help Europe PMC plus

Do data resources managed by EMBL-EBI and our collaborators make a difference to your work?
If so, please take 10 minutes to fill in our survey, and help us make the case for why sustaining open data resources is critical for life sciences research.
[Take survey](#)

Search life-sciences literature (44 087 585 articles, preprints and more)

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Advanced search

Free full text access

- ☐ Full text in Europe PMC (41 004)
- ☐ Link to free full text (3 753)

Type

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- ☐ Preprints (1 200)
- ☐ Books & documents (10)

1-25 of 51 765 results

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1 2 3 Next ...

Cerebrospinal fluid α -synuclein adds the risk of cognitive decline and is associated with tau pathology among non-demented older adults.

Liu W, Li W, Liu Z, Li Y, Wang X, Guo M, Wang S, Li Y, Jia J
Alzheimers Res Ther, 16(1):103, 10 May 2024
lower α -synuclein group (α -synuclein-L, n = 245) and a higher α -synuclein group (α -synuclein-H, n = 86... disorders α -synuclein-L. Lower level of α -synuclein α -synuclein-H Higher level of α -synuclein GSEA Gene
Cited by: 0 articles | PMID: 38725083 | PMCID: PMC11084056

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Research evaluation – future practices



A new contextualising part has been introduced in the application (...). In this part, the applicant must **describe how the merits** that have been indicated in the CV and under “Publications and other research output” **show the competence** to carry out the proposed research.

The list of publications in the application is now called “**Publications and other research outputs.**” It consists of two parts where the applicant must separate between publications and research outputs that are peer-reviewed and not peer-reviewed.



When assessing the research achievements of the applicants, focus on the **scientific content** and refrain from using **surrogate measures** of the quality of research outputs, such as Journal Impact Factors

Applicants may include **relevant additional information on their research careers** to provide context to the evaluation panels when assessing their research achievements and peer recognition

What change, in your opinion, would have the greatest value for future development of research assessment to make it more ethical, inclusive and relevant?



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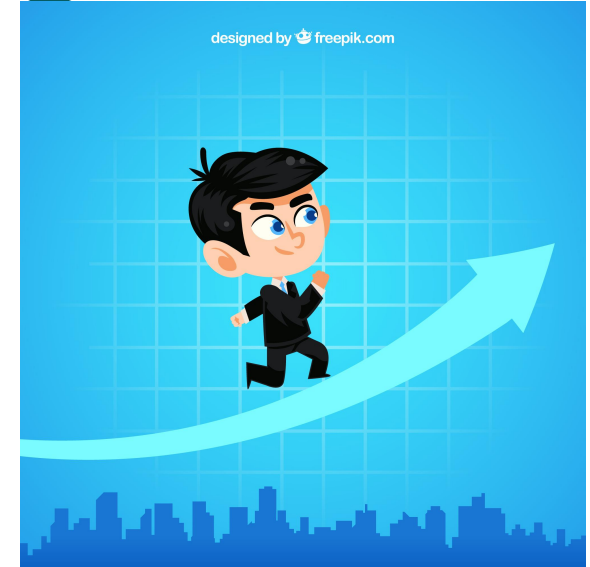
- Reproducibility
- Proper credit for all the authors, not only the first authors and corresponding authors
- Right now, if I am being honest, it is not as attractive to submit an open access paper compared to the top tiered journals. So promoting the idea of open access more and doing that might attract high quality researchers which in turn increase the reputation
- Science outreach to the public
- Transparency
- Take into account preprints also
- Quality over quantity
- It is more important to concentrate on research work than on publications
- Collaboration
- Inclusion
- Assess quality over quantity
- Drop requirements for "high impact" journals. Omit hard requirements for a specific number of publications for graduation. Place higher emphasis on "negative results" journals, open access journals
- Access contribution to scientific community, not just publishing
- Fair credit for work
- Relevance in current times
- New metric that is more fair and relevant for the research impact
- Reproducibility
- Include mentorship of junior researchers
- Look more granularly at contributions of different authors (not just first and corresponding authors)
- Higher quality by not only publishing success but also failure
- Alternatives to papers for scientific contribution
- Assess researcher's skills in other areas i.e. teaching, communication, policy
- Focus on high-impact science, not high-impact journals
- Social impact, open science, collaboration and diverse contributions
- Make sure that there are infrastructure and knowledge to be able to make good decisions
- Multi-metric assessment
- How much emphasis on science communication there is
- Indicators of research assessment should not be included in research job markets
- Research work impact (methods and use of results by the community at large)
- Quality over quantity
- Publish for the sake of furthering science, not for a number on your CV
- Have a better way of measuring research "success"
- More qualitative assessment
- More focus on quality rather than quantity
- Reward actual contributions instead of placement in author list
- How committed to open science a researcher is
- Stop the publish-or-perish culture



Be ready for the change



&

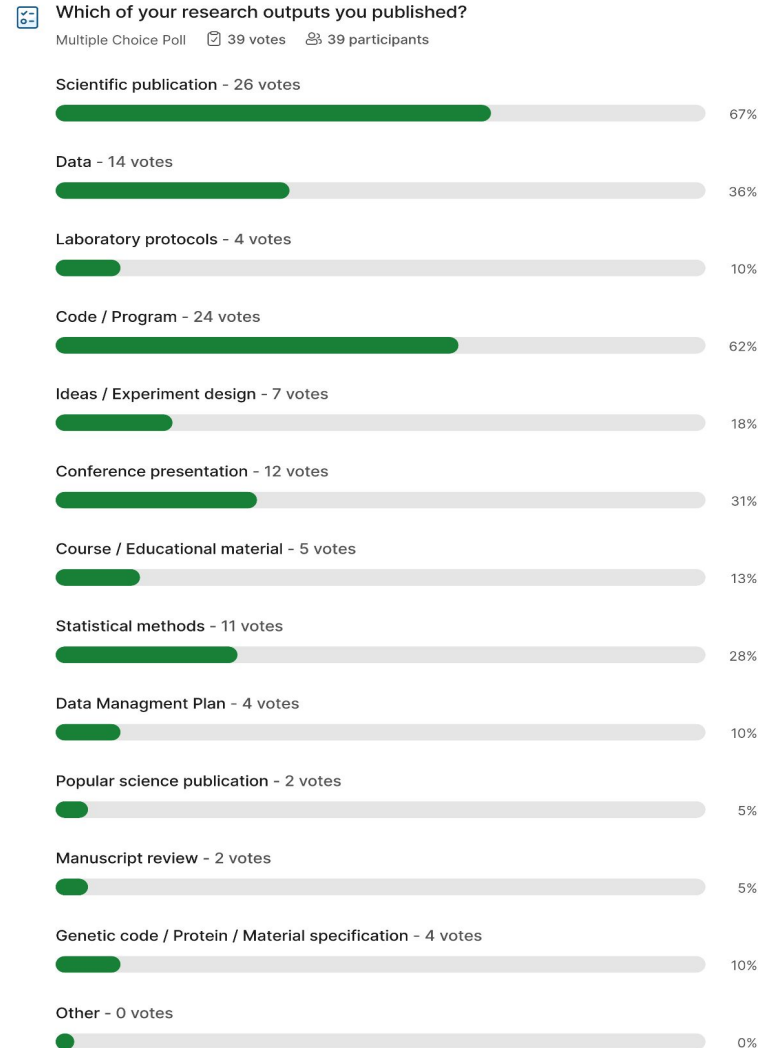


use it to your advantage!

Are you ready for the change?



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Show your work to the world



What can be published, shared, cited



PAPERS



DISCOVERIES



**EDUCATIONAL
MATERIAL**



**DATA/
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**STATISTICAL
MODELS**



**(LAB)
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**EDUCATIONAL
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**(LAB)
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DMPs



REVIEWS



PREPRINTS



IDEAS



...

Share smart = share FAIR



Right place

DOI

Formats

Metadata

“Think alien”

Data, Educational material, Notebooks,
(results)

Repositories Discipline-specific, Institutional,
General

Figshare, Zenodo, [EU OS Node](#)

Code

GitHub (no DOI!), Serve,
Figshare, Zenodo

Lab procedures, Bioinformatics
procedures, SOPs
protocols.io

Repositories



Journal service for supplementary material

Meet publisher requirements

Data available from published results

It can be costly and risky with data rights

Closed and unlikely access to ensure preservation

Institutional data repository

Accept various types of data, ensure long-term access

More reliable and there will be no costs

May not offer long-term sustainable access

May not have disciplinary metadata

Generic repository

Reach a wider audience.

Accepts several types, suitable for interdisciplinary data

Usually only simple metadata is available

No editorial control over the quality of deposited materials

Disciplinary repository

Offers expertise and experience in data management

Likely to accept complete data sets

Selective in the type of data they accept

Requires planning and high standards, may incur costs

Metadata - think alien



Would anyone understand your data/code/presentation without your help?

Make item understandable, usable and citable:

- data provenance

- data content and structure

- code usage/ documentation

- quality checks

- use conditions (license)

- authorship/ “cite as”

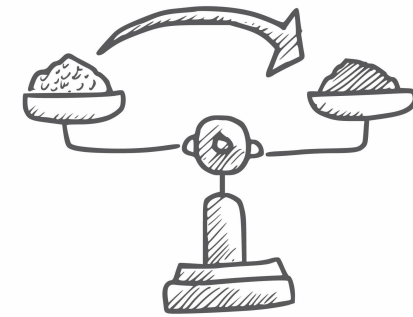
- ...



Metadata - standards



	Ready Standards	Own Standards
Interoperability	✓	✗
Flexibility	✗	✓
Quality and completeness	✓	⌘
Regulatory Compliance	✓	⌘
Time-demands	✓	✗
Complexity vs Tailored to needs	Compl. > Needs	Compl. < Needs



Check out the standards:

<https://www.openaire.eu/what-is-metadata>

<https://fairsharing.org/search?fairsharingRegistry=Standard>

<https://pitt.libguides.com/metadata/metadata-discovery/metadata-standards>

Metadata exercise



Do you think you can use this data?

What information you need to add to use and acknowledge?

Which dataset would you trust and reuse? Why?

Acknowledge the others



Acknowledge when?



Whenever you use someone's work or input!

Acknowledge the others



Acknowledge who?



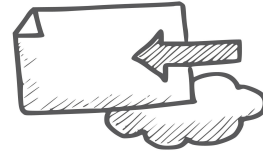
AUTHORS



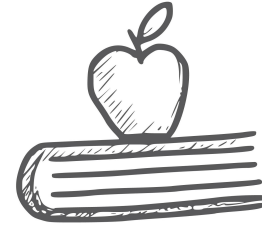
CONTRIBUTORS



ARTISTS



**DATA/CODE
PROVIDERS**



**INSTITUTION/
MENTOR**



FUNDERS

Acknowledge the others



Acknowledge who?



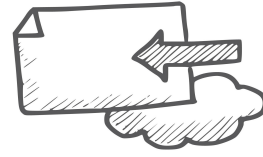
AUTHORS



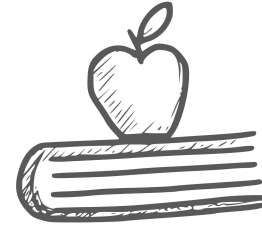
CONTRIBUTORS



ARTISTS



**DATA/CODE
PROVIDERS**



**INSTITUTION/
MENTOR**



FUNDERS



REVIEWERS



AI

Acknowledge the others



Acknowledge how?

Authorship
Acknowledgement
Citation

Acknowledge the others

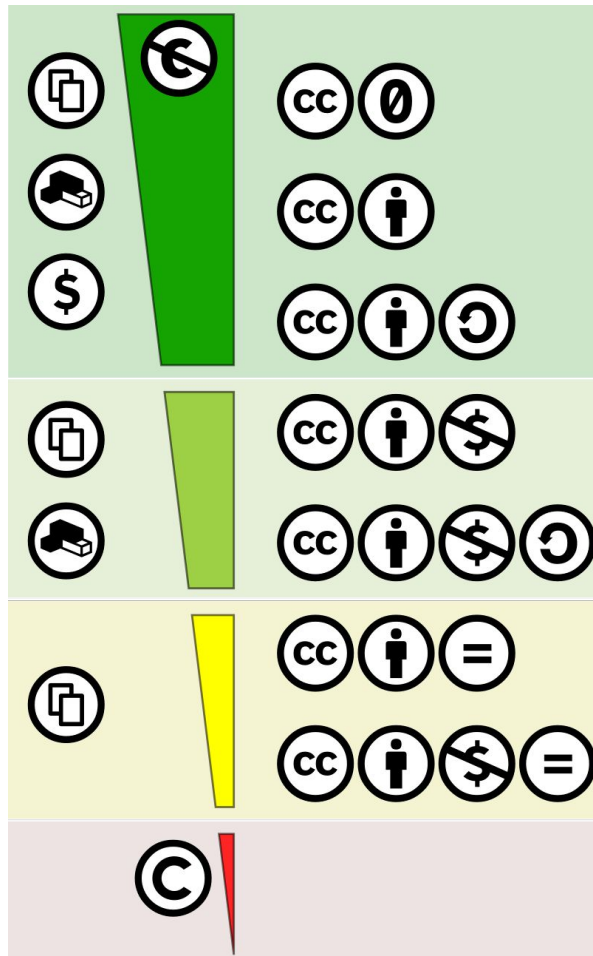
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Ten simple rules for getting and giving credit for data

Elisha M. Wood-Charlson , Zachary Crockett, Chris Erdmann, Adam P. Arkin, Carly B. Robinson

Published: September 29, 2022 • <https://doi.org/10.1371/journal.pcbi.1010476>

Article

Authors

Metrics

Comments

Media Coverage



Introduction

Conclusions

Acknowledgments

References

Reader Comments

Figures

Figures



Citation: Wood-Charlson EM, Crockett Z, Erdmann C, Arkin AP, Robinson CB (2022) Ten simple rules for getting and giving credit for data. PLoS Comput Biol 18(9): e1010476. <https://doi.org/10.1371/journal.pcbi.1010476>

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Make it easy for others

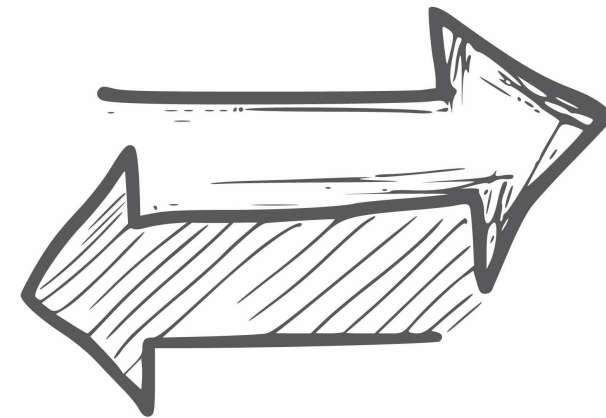


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PROMOTE BEST PRACTICES





**Open Science practices
already
make the difference**



OS is working to researchers' advantage



OPEN ACCESS PEER-REVIEWED
RESEARCH ARTICLE

An analysis of the effects of sharing research data, code, and preprints on citations

Giovanni Colavizza , Lauren Cadwallader, Marcel LaFlamme, Grégory Dozot, Stéphane Lecorney, Daniel Rappo, Iain Hrynaszkiewicz 

Published: October 30, 2024 • <https://doi.org/10.1371/journal.pone.0311493>

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Correction

Abstract

- 1 Introduction
 - 2 State of the art
 - 3 Methods and data
 - 4 Results
 - 5 Discussion
 - 6 Conclusion
- Supporting information
Acknowledgments
References

Correction

10 Dec 2024: The PLOS ONE Staff (2024) Correction: An analysis of the effects of sharing research data, code, and preprints on citations. PLOS ONE 19(12): e0315776. <https://doi.org/10.1371/journal.pone.0315776> | [View correction](#)

Abstract

Calls to make scientific research more open have gained traction with a range of societal stakeholders. Open Science practices include but are not limited to the early sharing of results via preprints and openly sharing outputs such as data and code to make research more reproducible and extensible. Existing evidence shows that adopting Open Science practices has effects in several domains. In this study, we investigate whether adopting one or more Open Science practices leads to significantly higher citations for an associated publication, which is one form of academic impact. We use a novel dataset known as Open Science Indicators, produced by PLOS and DataSeer, which includes all PLOS publications from 2018 to

open data, code and pre-prints result in more citations

<https://doi.org/10.1371/journal.pone.0311493>

open access-published research gets more attention

<https://doi.org/10.48550/arXiv.2406.10535>

Computer Science > Digital Libraries

[Submitted on 15 Jun 2024]

Evaluating Open Access Advantages for Citations and Altimetrics (2011-21): A Dynamic and Evolving Relationship

Michael Taylor

Differences between the impacts of Open Access (OA) and non-OA research have been observed over a wide range of citation and [altmetric indicators](#), usually finding an Open Access Advantage (OAA) within specific fields. However, science-wide analyses covering multiple years, indicators and disciplines are lacking. Using citation counts and six altmetrics for 38.7M articles published 2011-21, we compare OA and non-OA papers. The results show that there is no universal OAA across all disciplines or impact indicators: the OAA for citations tends to be lower for more recent papers, whereas the OAAs for news, blogs and Twitter are consistent across years and unrelated to volume of OA publications, whereas the OAAs for Wikipedia, patents and policy citations are more complex. These results support different hypotheses for different subjects and indicators. The evidence is consistent with OA accelerating research impact in the Medical & Health Sciences, Life Sciences and the Humanities; that increased visibility or discoverability is a factor in promoting the translation of research into socio-economic impact; and that OA is a factor in growing online engagement with research in some disciplines. OAAs are therefore complex, dynamic, multi-factorial and require considerable analysis to understand.

Subjects: **Digital Libraries (cs.DL)**
Cite as: [arXiv:2406.10535](#) [**cs.DL**]
(or [arXiv:2406.10535v1](#) [**cs.DL**] for this version)
<https://doi.org/10.48550/arXiv.2406.10535> 

Computer Science > Digital Libraries

[Submitted on 24 Apr 2024 (v1), last revised 3 Sep 2024 (this version, v2)]

An analysis of the effects of sharing research data, code, and preprints on citations

Giovanni Colavizza, Lauren Cadwallader, Marcel LaFlamme, Grégory Dozot, Stéphane Lecorney, Daniel Rappo, Iain Hrynaszkiewicz

Calls to make scientific research more open have gained traction with a range of societal stakeholders. Open Science practices include but are not limited to the early sharing of results via preprints and openly sharing outputs such as data and code to make research more reproducible and extensible. Existing evidence shows that adopting Open Science practices has effects in several domains. In this study, we investigate whether adopting one or more Open Science practices leads to significantly higher citations for an associated publication, which is one form of academic impact. We use a novel dataset known as Open Science Indicators, produced by PLOS and DataSeer, which includes all PLOS publications from 2018 to 2023 as well as a comparison group sampled from the PMC Open Access Subset. In total, we analyze circa 122'000 publications. We calculate publication and author-level citation indicators and use a broad set of control variables to isolate the effect of Open Science Indicators on received citations. We show that Open Science practices are adopted to different degrees across scientific disciplines. We find that the early release of a publication as a preprint correlates with a significant positive citation advantage of about 20.2% on average. We also find that sharing data in an online repository correlates with a smaller yet still positive citation advantage of 4.3% on average. However, we do not find a significant citation advantage for sharing code. Further research is needed on additional or alternative measures of impact beyond citations. Our results are likely to be of interest to researchers, as well as publishers, research funders, and policymakers.

Subjects: **Digital Libraries (cs.DL)**
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open data and pre-prints result in more citations

<https://doi.org/10.48550/arXiv.2404.16171>

OS is working to researchers' advantage



Sharing ancient human DNA

- accelerated progress
- wide collaboration
- high reproducibility
- increased credibility
- high number of studies/publications
- community-driven development of bioinformatics tools

Quantitative Biology > Populations and Evolution

[Submitted on 14 Jul 2014 (v1), last revised 15 Jul 2014 (this version, v2)]

When data sharing gets close to 100%: what ancient human DNA studies can teach the Open Science movement

Paolo Anagnostou, Marco Capocasa, Nicola Milia, Emanuele Sanna, Daniela Luzi, Giovanni Destro Bisol

This study analyzes rates and ways of data sharing regarding mitochondrial, Y chromosomal and autosomal polymorphisms in a total of 162 papers on human ancient DNA published between 1988 and 2013. For the most part, data are available in such a way as to make their scrutiny and reuse possible. The estimated sharing rate is not far from totality (97.6% +/- 2.1%) and substantially higher than observed in other fields of genetic research (Evolutionary, Medical and Forensic Genetics). A questionnaire-based survey suggests that the authors awareness of the importance of openness and transparency for scientific progress is a fundamental factor for the achievement of such a high sharing rate. Most data were made available through body text, but the use of primary databases increased with the application of complete mitochondrial and next generation sequencing methods. Our study highlights three important aspects. First, we provide evidence that researchers motivations are as necessary as stakeholders policies and norms to achieve very high sharing rates. Second, careful analyses of the ways in which data are made available are an important first step to maximize data findability, accessibility, useability and preservation. Third and finally, the case of human ancient DNA studies demonstrates how Open Science can foster scientific advancements, showing that openness and transparency can help build rigorous and reliable scientific practices even in the presence of complex experimental challenges.

Comments: 26 pages, 7 figures (1 supplementary), 6 Tables (5 supplementary of which 2 are available only upon request)

Subjects: **Populations and Evolution (q-bio.PE)**; Digital Libraries (cs.DL)

Cite as: [arXiv:1407.3682](https://arxiv.org/abs/1407.3682) [q-bio.PE]

(or [arXiv:1407.3682v2](https://arxiv.org/abs/1407.3682v2) [q-bio.PE] for this version)

<https://doi.org/10.48550/arXiv.1407.3682> 

Related DOI: <https://doi.org/10.1371/journal.pone.0121409> 

<https://doi.org/10.1371/journal.pone.0121409>

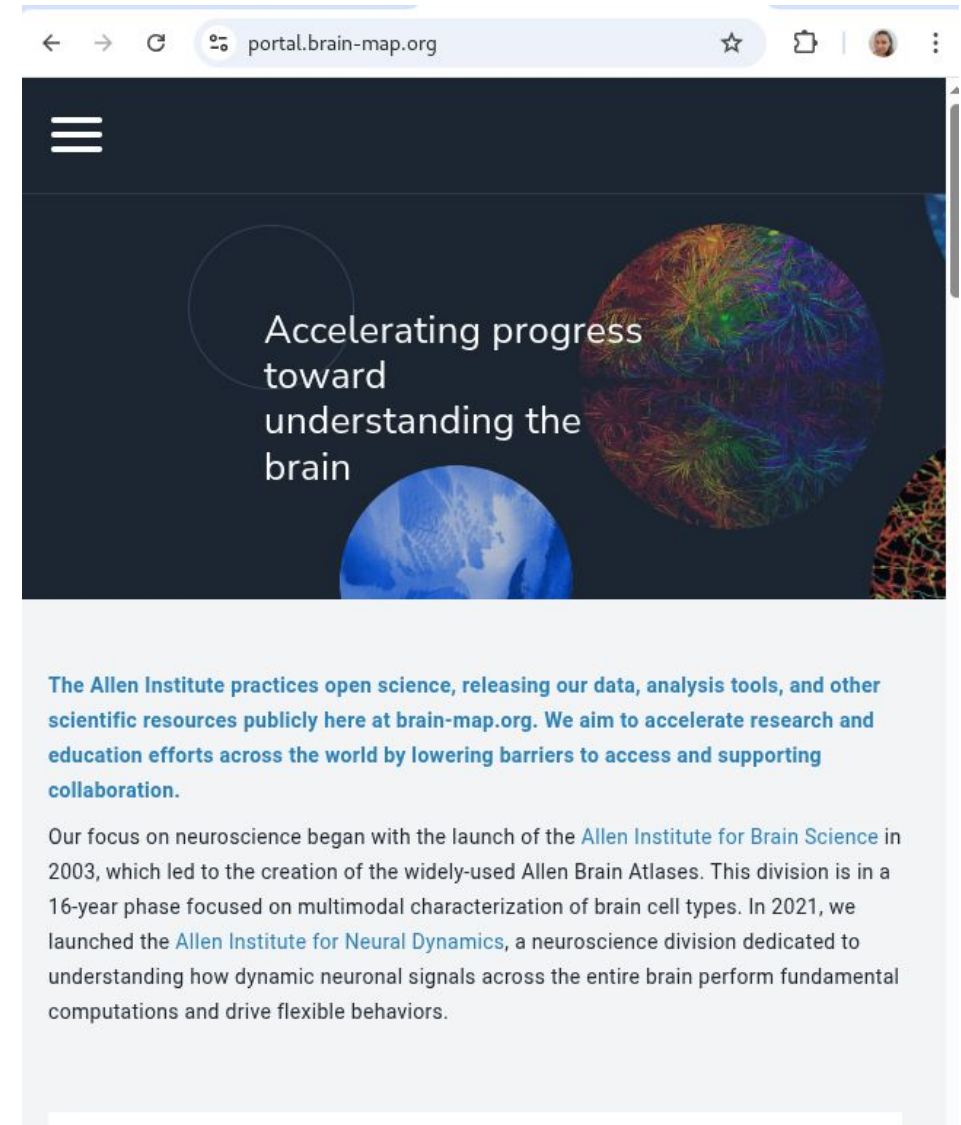
OS is working to researchers' advantage



Allen Brain Observatory

Public resource providing **in vivo** recordings of neuronal activity in the mouse brain

- accelerated research and discovery
- saving of public funds
- development of brain-inspired artificial intelligence and other tools
- increased citation and recognition
- high international collaboration
- education and training



Take-home messages

- current researchers' evaluation practices were criticised already for a long time
- **h-index** and similar are not objective measures, often resulting in unethical practices, skewed results and loss of trust in science
- organisations around the world decided on **making a change to researchers' assessment practices**
- [CoARA](#) is currently the largest movement and Sweden is a part of it
- **Open Science** practices already **benefit** researchers and these benefits will grow
- **you already can work towards the future!**

