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The Value of Data (winners)

1. Economic

- a. Human Genome Project (HGP) US investment of \$3.8 billion, helped drive \$796 billion in economic impact & \$244 billion in total personal income

1. Societal

- a. Increases trust
- b. Public Health - e.g. COVID 19
- c. SDGs

1. Science itself

- a. Speeds up innovation
- b. Reduces publication bias
- c. Increases integrity & rigour - reproducibility
- d. Increases accountability



Tripp, Simon, and Grueber Martin. 'Economic Impact of the Human Genome Project (Batelle Memorial Institute)', May 2011. http://www.battelle.org/docs/default-document-library/economic_impact_of_the_human_genome_project.pdf?sfvrsn=2.

Wadman, Meredith. 'Economic Return from Human Genome Project Grows'. Nature News. Accessed 23 November 2020. <https://doi.org/10.1038/nature.2013.13187>.

Grosjean, Martine. '\$3.8B Investment in Human Genome Project Drove \$796B in Economic Impact Creating 310,000 Jobs and Launching the Genomic Revolution'. Text. FUTURIUM - European Commission (blog), 29 April 2015. <https://ec.europa.eu/futurium/en/content/38b-investment-human-genome-project-drove-796b-economic-impact-creating-310000-jobs-and>.

“ In the humanities, we all use research data, although we may not be aware of it. It is like in the case of Monsieur Jourdain, the title character of Molière’s *Le Bourgeois gentilhomme*, who learnt, to his great satisfaction, that unwittingly he had been speaking prose all his life. With research data in the humanities it is exactly the same: **you are using it, even if you don't know it, and once you realise it, it will affect your research workflow forever.**

historical artefacts
digital (incl. digitised) documents
Images (2D or 3D)
sound and video recordings
archaeological finds,

Medieval manuscripts
poetry texts
social media posts,
paintings
scans of architecture
recordings of a theatre performance

XML mark-up (people, objects and
locations)
Footnotes or critical commentary

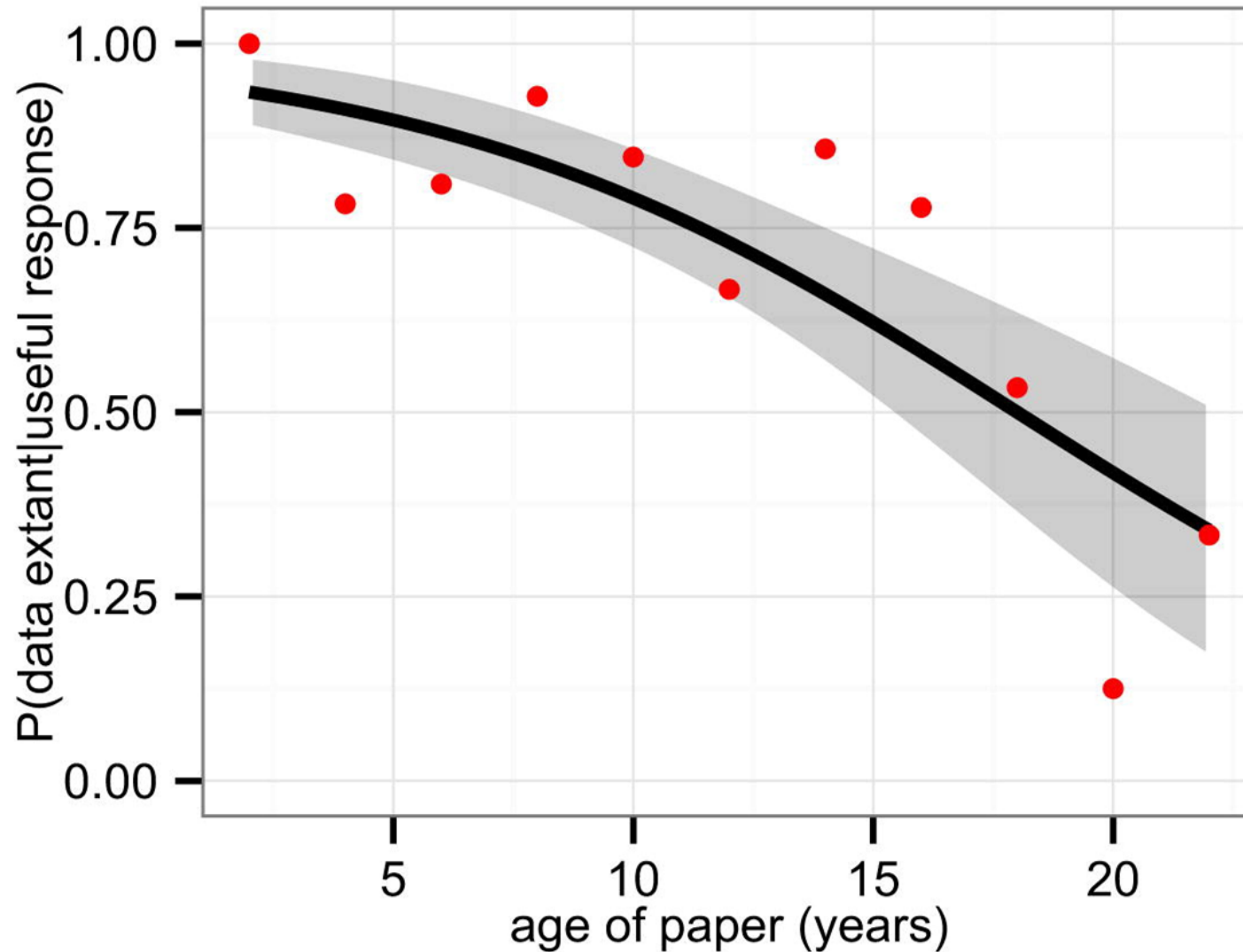
descriptive metadata
(e.g. contributors, title, publisher, place,
date, number of pages),

data in the humanities are also an effect
of operationalisation and interpretive processes

all materials and assets scholars
collect, generate and use during all stages of the
research cycle

The problem: data erosion

D



Probability of finding the data associated with a paper declined by 17% every year

Vines, Timothy et al. "The Availability of Research Data Declines Rapidly with Article Age." *Current Biology* 24, no. 1 (June 1, 2014): 94–97. doi:10.1016/j.cub.2013.11.014.

Table 8. “The following statements relate to your views on the use of scientific research data. Tell us how much you agree with each statement”.

Answer	n (%)
Lack of access to data generated by other researchers or institutions is a major impediment to progress in science.	1777 (74.6%)
Lack of access to data generated by other researchers or institutions has restricted my ability to answer scientific questions.	1770 (50.5%)
Data may be misinterpreted due to complexity of the data.	1769 (78.7%)
Data may be misinterpreted due to poor quality of the data.	1764 (78.6%)
Data may be used in other ways than intended.	1765 (75.4%)

<https://doi.org/10.1371/journal.pone.0229003.t008>

Tenopir C, Rice NM, Allard S, Baird L, Borycz J, Christian L, et al. (2020) Data sharing, management, use, and reuse: Practices and perceptions of scientists worldwide. *PLoS ONE* 15(3): e0229003.
<https://doi.org/10.1371/journal.pone.0229003>



COVID

**showcases the power of open access and open data
&
exposes systemic flaws in the existing system**

'We're opening everything': Scientists share coronavirus data in unprecedented way to contain, treat disease



[They say] we're opening everything because it's important that we advance things fast. Well, the flip side of this argument is that your normal behaviour is to put barriers to science

Professor Vincent Larivière, University of Montreal

"It's a temporary glimpse of a world where science is openly shared. But the measures also raise questions about the way science-as-usual is practised."

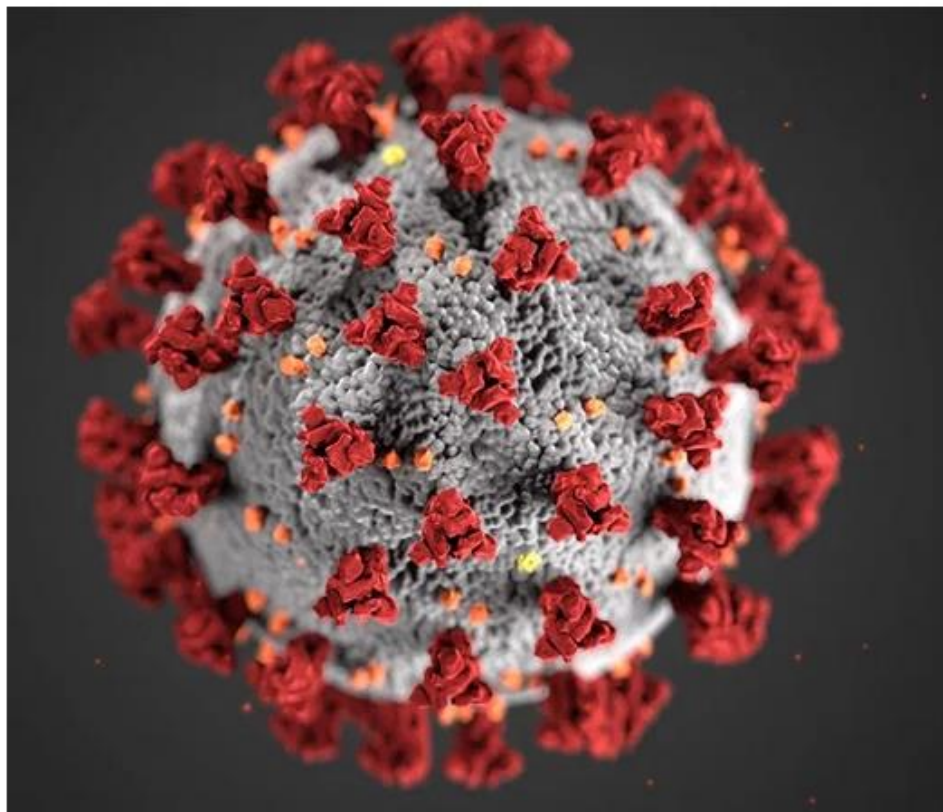
"...the move to speed up publication and share research is a tacit admission that business-as-usual in research slows down science"

Kelly Crowe · CBC News

Lancet, NEJM retract controversial COVID-19 studies based on Surgisphere data

Retraction Watch

Tracking retractions as a window into the scientific process



Two days after issuing expressions of concern about controversial papers on Covid-19, *The Lancet* and the New England Journal of Medicine have retracted the articles because a number of the authors were not granted access to the underlying data.

Coronavirus outbreak

The Lancet changes editorial policy after hydroxychloroquine Covid study retraction

New policy comes after serious quality control questions were raised about the data relied on by a study in the medical journal

Melissa Davey

@MelissaLDavey

Tue 22 Sep 2020 05:08 BST



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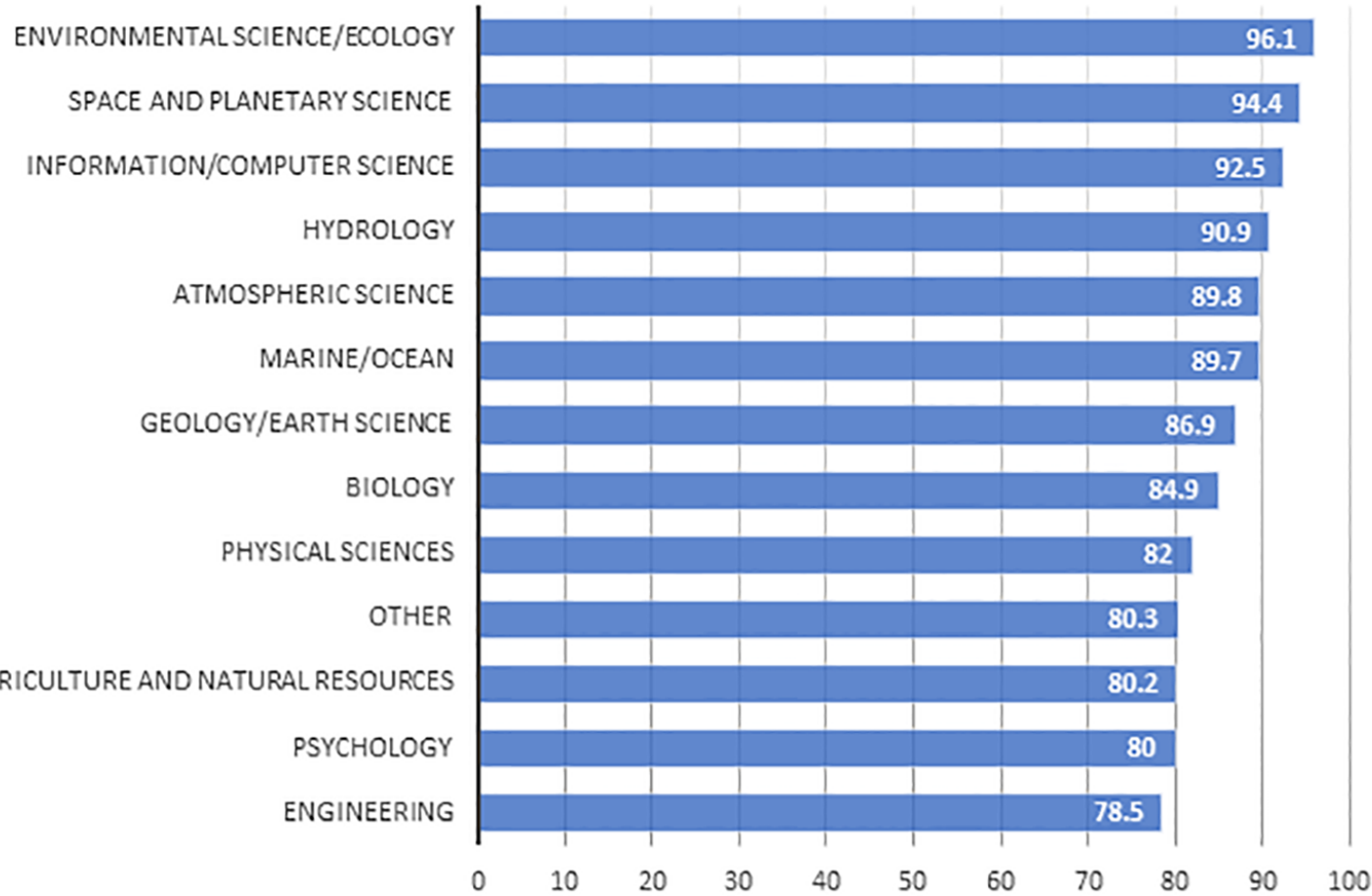
"One of the questions raised by the publication of the Surgisphere paper was how the paper passed the peer-review process."



▲ The Lancet has changed its editorial policy after publishing a study in May which concluded that Covid-19 patients who received the drug hydroxychloroquine were dying at higher rates. But figures on the number of deaths and patients in hospital cited by the authors did not match up with official government and health department data. Photograph: George Frey/Reuters

One of the world's leading medical journals, the Lancet, has reformed its editorial policies following a shocking case of apparent research misconduct involving the study of hydroxychloroquine as a treatment for Covid-19.

I would be willing to share data across a broad group of researchers (%).



JCE
JOURNAL OF CLINICAL EPIDEMIOLOGY

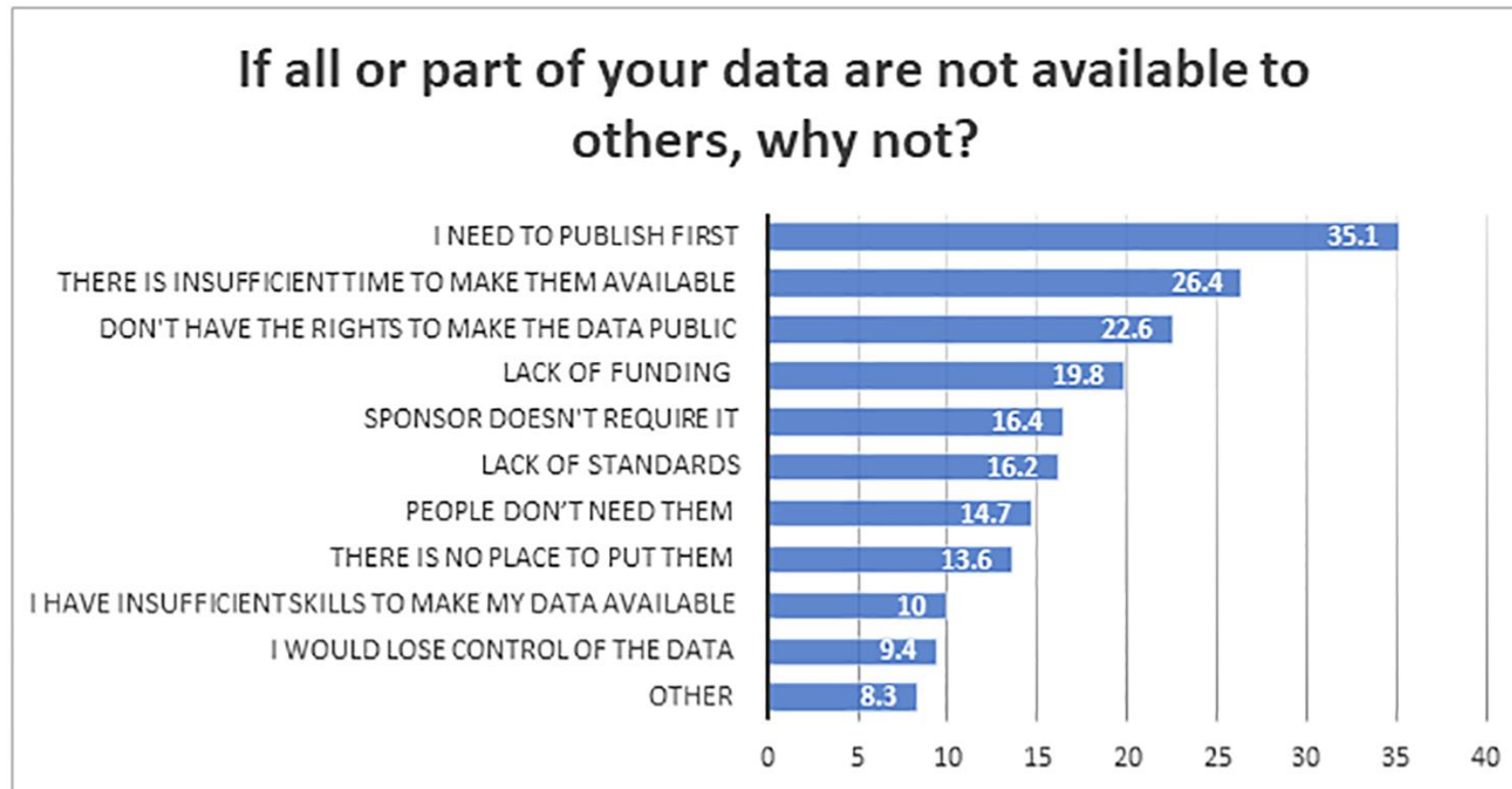
ORIGINAL ARTICLE | VOLUME 109, P111-116, MAY 01, 2019

Authors of trials from high-ranking anesthesiology journals were not willing to share raw data

Mirko Gabelica • Jakica Cavar • Livia Puljak

Published: February 06, 2019 • DOI: <https://doi.org/10.1016/j.jclinepi.2019.01.012> • Check for updates

Tenopir C, Rice NM, Allard S, Baird L, Borycz J, Christian L, et al. (2020) Data sharing, management, use, and reuse: Practices and perceptions of scientists worldwide. PLoS ONE 15(3): e0229003. <https://doi.org/10.1371/journal.pone.0229003>



Tenopir C, Rice NM, Allard S, Baird L, Borycz J, Christian L, et al. (2020) Data sharing, management, use, and reuse: Practices and perceptions of scientists worldwide. *PLoS ONE* 15(3): e0229003. <https://doi.org/10.1371/journal.pone.0229003>



Figure 9 – Importance of academic activities for research careers

Based on survey question 7, ranking question (cf. Annex 1). Number of respondents: 191-195/197

Saenen, Bregt, et al. 'Research Assessment in the Transition to Open Science: 2019 EUA Open Science and Access Survey Results',

Figure 10 – Evaluation of academic activities for research careers

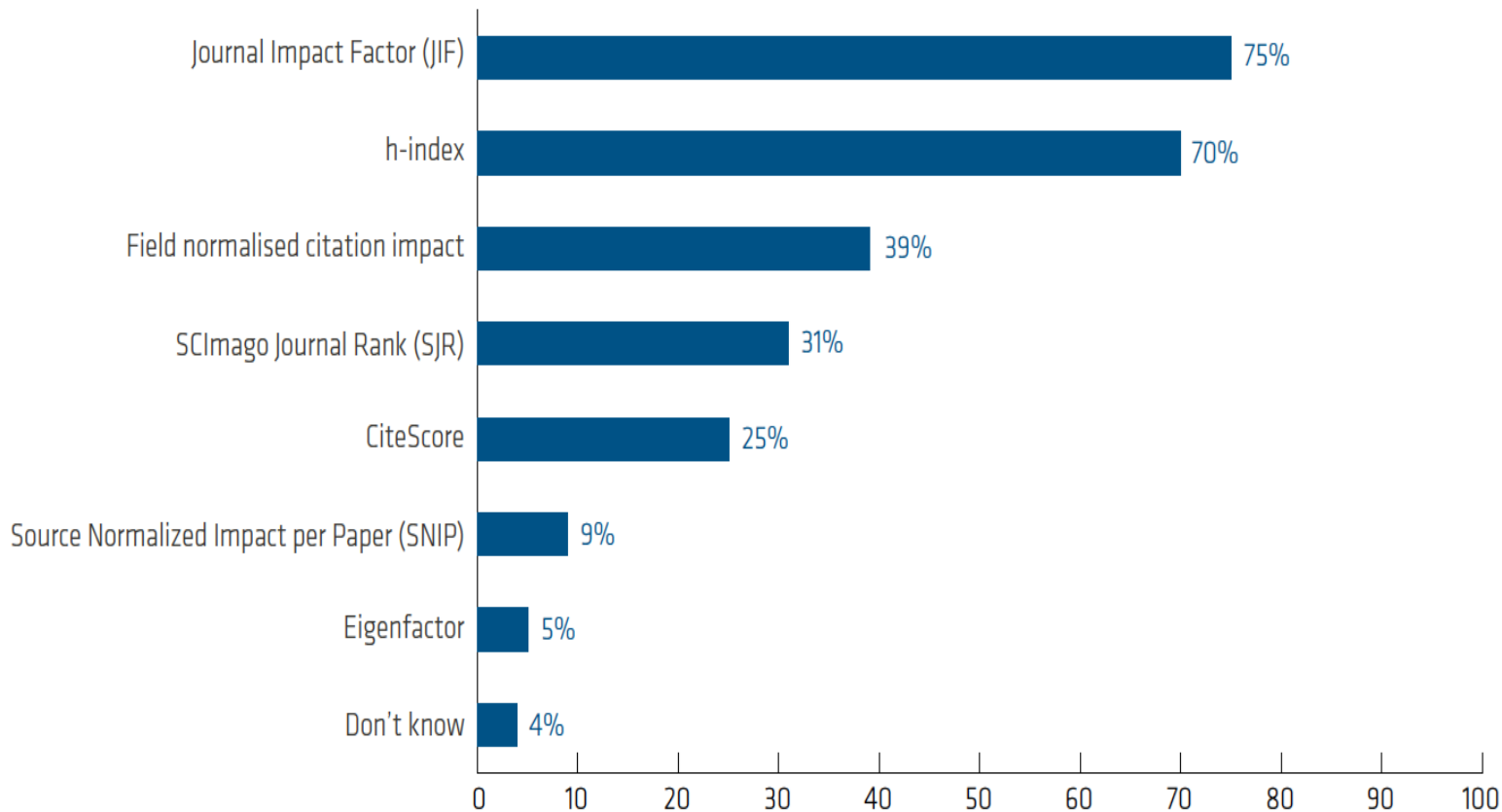
Based on survey question 8, ranking question (cf. Annex 1).
Number of respondents: 194-195/197



Saenen, Bregt, et al. '[Research Assessment in the Transition to Open Science: 2019 EUA Open Science and Access Survey Results](#)',

Figure 11 – Publication metrics used for research careers

Based on survey question 8a, multiple-choice (cf. Annex 1). Number of respondents: 185/186



“ In summary, the survey results indicate **a stark divide between the research assessment practices that universities consider important and those that they consider unimportant.**

Open Science and Access indicators, Altmetrics and metrics measuring academic attention and uptake **are considered of little importance or outright unimportant** by about half of the survey respondents.

Researchers tell me they feel **pressure to publish in particular venues** in order to gain the respect of their peers, which **wrongly suggests that where you publish something is more important than what you say**. That just can't be right.

People talk to me about **"REF-able publications"** – a **total distortion of the value of research** and a constraint on the diversity of research objectives.

the processes researchers use to communicate with each other have now become so ingrained into the recognition and reward system that **publication and citation seem to have become ends in themselves**.

Parliamentary Under Secretary of State (Minister for Science, Research and Innovation)

Responsibilities include:

- science and research
- innovation
- intellectual property
- space
- technology



Despite the rich variety of outputs that can come from research, over **97% of outputs submitted to REF 2014 were text-based**. Just think about that.

The REF ruleset, implemented in a risk-averse way, **has become the default tool for many university leaders** to effect institutional change

This could be **having a profound effect on the very integrity of science itself** – leading to questionable research practices and evidence of a growing crisis in the reproducibility of research

4 in 10 surveyed researchers believe that their workplace puts more value on metrics than on research quality.

Bibliometrics: The Leiden Manifesto for research metrics

Diana Hicks, Paul Wouters, Ludo Waltman, Sarah de Rijcke & Ismael Rafols

22 April 2015

Use these ten principles to guide research evaluation, urge Diana Hicks, Paul Wouters and colleagues.

PDF

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Subject terms:

Careers · Research management · Publishing



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@DORAssessment

Declaration On Research Assessment

Improving how research is assessed

Signed by >500 organizations and >12,500 individuals

Supporting organizations

ascb

CANCER RESEARCH UK

eLIFE

EMBO

Flinders Research

Wellcome

PLOS

University of Edinburgh

Wiley

MAKE DATA COUNT

HOME

ABOUT

RESOURCES

ENGAGE

BLOG

Data, a first-class research output

LEARN MORE!

IT'S TIME TO MAKE YOUR DATA COUNT!

PUBLISHERS: MAKE YOUR DATA CITATIONS COUNT!

COUNTER CODE OF PRACTICE FOR RESEARCH DATA

THE HONG KONG PRINCIPLES FOR ASSESSING RESEARCHERS

FOSTERING RESEARCH INTEGRITY

What are the HKP?

The Hong Kong Principles (HKP) were developed as part of the 6th World Conference on Research Integrity. They were developed to reinforce the need to ensure that researchers are rewarded for specific behaviors that promote trustworthy research. The HKP have been developed with the idea that implementation of them could assist in how researchers are assessed for career advancement with a view to strengthen research integrity.

PRINCIPLE

IMPLEMENTATION EXAMPLES

1. Assess responsible research practices.

The NIH recommends Experimental Design Assistant (EDA) developed by NCICs. This 10-module online tool helps researchers prepare the design and analysis requested for grant applications.

2. Value complete reporting.

Wellcome Trust's Open Research (WOR) editorial policies require authors to use reporting guidelines for protocols (e.g., SPIRIT) and completed studies (e.g., ARRIVE). The Universidade Federal de Ciências da Saúde de Porto Alegre (UFCSA, Brazil), has a formal course on reporting guidelines, that students can complete as formal credit towards their degree.

3. Reward the practice of open science.

The University of Cambridge has introduced 'data champions', Geth University of Technology, The Netherlands, is implementing this as a career assessment criterion. The Nanyang Technological University (NTU), Singapore, implemented an Open Access policy in 2011. At NTU's faculty of medicine, random audits are conducted to ensure adherence.

4. Acknowledge a broad range of research activities.

The Netherlands Organization for Scientific Research is its third call for replication studies. PLOS Biology and eLife have meta-research sections in their respective journals.

5. Recognize essential other tasks such as peer reviewing and mentoring.

The University of Glasgow's academic promotion criteria rewards researchers for participation in peer review and other related activities (e.g., journal editorship).

The full HKP article can be accessed at <https://www.hongkongprinciples.org/publications/hong-kong-principles>

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*"With the COVID-19 pandemic putting a spotlight on the importance of international collaboration in scientific research and the social impact of research becoming more evident, **there is now renewed urgency for funders to come together and reconsider how research is assessed and evaluated.**"*

Responsible Research Assessment – a virtual conference from the Global Research Council

November 23 - 27, 2020

GLOBAL
RESEARCH
COUNCIL

A welcome from the GRC



"The GRC is dedicated to promoting the sharing of data and best practices for high-quality collaboration among funding agencies worldwide. It recognises the need to build on its previous work, such as the principles on peer/merit review, for developing a shared understanding of the topic of responsible research assessment amongst funders. With the COVID-19 pandemic putting a spotlight on the importance of international collaboration in scientific research and the social impact of research becoming more evident, there is now renewed urgency for funders to come together and reconsider how research is assessed and evaluated. This conference presents a great opportunity for research funders to come together, work together, learn and look to the future. We look forward to engaged discussions over the week."



Professor Andrew Thompson

UKRI Champion for International and GRC Governing Board member



Dr. Molapo Qhobela

CEO of NRF
South Africa and Chair of the GRC Governing Board

What makes Open Science Transformative?

Open INFRASTRUCTURE



https://upload.wikimedia.org/wikipedia/commons/e/e4/Sectiongang_hungerford1917.jpg

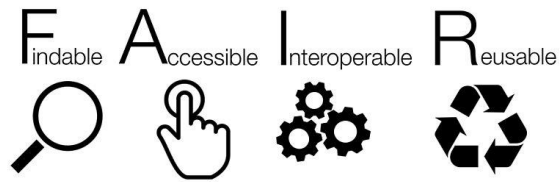


Ingy the Wingy CC BY

<https://www.flickr.com/photos/ingythewingy/4793928695/in/photostream/>



Catriona J MacCallum, 2008 CC BY



FAIR

Findable

The first step in (re)using data is to find them. **Metadata and data should be easy to find for both humans and computers. Machine-readable metadata are essential for automatic discovery of datasets and services**, so this is an essential component of the [FAIRification process](#).

Accessible

Once the user finds the required data, she/he needs to know how can they be accessed, possibly including authentication and authorisation.

Interoperable

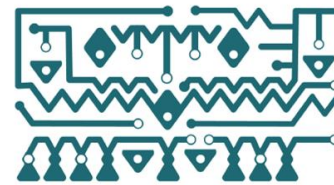
The data usually need to be integrated with other data. In addition, the data need to interoperate with applications or workflows for analysis, storage, and processing.

Reusable

The ultimate goal of FAIR is to optimise the reuse of data. To achieve this, metadata and data should be well-described so that they can be replicated and/or combined

in different settings.

Wilkinson, Mark D., Michel Dumontier, IJsbrand Jan Aalbersberg, Gabrielle Appleton, Myles Axton, Arie Baak, Niklas Blomberg, et al. 'The FAIR Guiding Principles for Scientific Data Management and Stewardship'. *Scientific Data*, 15 March 2016. <https://doi.org/10.1038/sdata.2016.18>.



CARE Principles for Indigenous Data Governance

CARE

Collective Benefit

Data ecosystems shall be designed and function in ways that enable Indigenous Peoples to derive benefit from the data.

Authority to Control

Indigenous Peoples' rights and interests in Indigenous data must be recognised and their authority to control such data be empowered. Indigenous data governance enables Indigenous Peoples and governing bodies to determine how Indigenous Peoples, as well as Indigenous lands, territories, resources, knowledges and geographical indicators, are represented and identified within data

Responsibility

Those working with Indigenous data have a responsibility to share how those data are used to support Indigenous Peoples' self-determination and collective benefit. Accountability requires meaningful and openly available evidence of these efforts and the benefits accruing to Indigenous Peoples.

Ethics

Indigenous Peoples' rights and wellbeing should be the primary concern at all stages of the data life cycle and across the data ecosystem.

Research Data Alliance International Indigenous Data Sovereignty Interest Group. (September 2019). "CARE Principles for Indigenous Data Governance." *The Global Indigenous Data Alliance*. [GIDA-global.org](https://gida-global.org)

Existing principles within the open data movement (e.g. FAIR: findable, accessible, interoperable, reusable) primarily focus on characteristics of data that will facilitate increased data sharing among entities while ignoring power differentials and historical contexts.



#BeFAIRandCARE

Infrastructure: Persistent Identifiers & Metadata

- **PIDS:**

- A PID is a globally unique, persistent and resolvable identifier that is based
- on an openly identified schema.
- PIDs create stable links for objects, and increasingly are the preferred method for citation and reuse, enabling consistent attribution and tracking.
- PIDs can identify digital objects (documents, data, software), physical objects (people, samples) and conceptual entities (organisations, projects).
- PIDs facilitate citation and increased findability
- links are being created between publications and their associated datasets (bidirectional linking).



- **Metadata:**

- 'data about data',
- a series of fields that describe data and other research objects in consistent and standardised ways
- standards created by different research communities and disciplines, to provide optimal, tailored ways of describing data - a formal, shared, schematic way of representing knowledge through common language



FORCE11
The Future of Research Communications and e-Scholarship

ABOUT ▾ COMMUNITY ▾ GROUPS ▾ RESOURCES ▾ NEWS + BLOGS ▾ CONFERENCES ▾ PUBLICATIONS ▾ MEDIA ▾ DONATE ▾

FORCE11 ▸ Groups ▸ Joint Declaration of Data Citation Principles - FINAL


JOINT DECLARATION OF DATA CITATION PRINCIPLES - FINAL

When citing please use: Data Citation Synthesis Group: Joint Declaration of Data Citation Principles. Martone M. (ed.) San Diego CA: FORCE11: 2014 [/datacitation].

ENDORSEMENT LIST

PREAMBLE

Sound, reproducible scholarship rests upon a foundation of robust, accessible data. For this to be so in practice as well as theory, data must be accorded due importance in the practice of scholarship and in the enduring scholarly record. In other words, data should be considered legitimate, citable products of research. Data citation, like the citation of other evidence and sources, is good research practice and is part of the scholarly ecosystem supporting data reuse.



<https://www.force11.org/group/joint-declaration-data-citation-principles-final>

Credit : data citation

Your article is cited more (up to 25.36% ($\pm 1.07\%$), with articles that have a Data Availability Statement that includes a link to a repository via a URL or other permanent identifier

Minimum Requirements

- author names, repository name, date + persistent unique identifier (such as DOI or URI)
- citation should link to the dataset directly via the persistent identifier
- comprehensive, machine-readable landing pages for deposited data
- guidance to authors to include data in references

Colavizza, Giovanni, Iain Hrynaszkiewicz, Isla Staden, Kirstie Whitaker, and Barbara McGillivray. 'The Citation Advantage of Linking Publications to Research Data'. PLOS ONE 15, no. 4 (22 April 2020): e0230416.
<https://doi.org/10.1371/journal.pone.0230416>.

The Responsibility of Publishers

- The infrastructure that enables access, reuse and discovery of scholarly knowledge is as important for discovery as the text of published articles or any other research output.
- Our role is not to be a gatekeeper to the exchange of scholarly knowledge but a facilitator & service provider (rigour, speed, integrity).
- Can publishers, whether commercial or not-for profit, intrinsically align their interests with those of the research community who want to harness 21st technology, for the benefit of science and society
- Can we be as open minded and collaborative in our approach to publishing and scholarly comms as we ask others to be in theirs?