



ACCEPTED MANUSCRIPT

How open science helps researchers succeed

Erin C McKiernan , Philip E Bourne, C Titus Brown, Stuart Buck, Amye Kenall, Jennifer Lin, Damon McDougall, Brian A Nosek, Karthik Ram, Courtney K Soderberg, Jeffrey R Spies, Kaitlin Thaney, Andrew Updegrove, Kara H Woo, Tal Yarkoni

National Autonomous University of Mexico, Mexico; National Institutes of Health, United States; University of California, Davis, United States; Laura and John Arnold Foundation, United States; BioMed Central, United Kingdom; CrossRef, United Kingdom; University of Texas at Austin, United States; Center for Open Science, United States; University of California, Berkeley, United States; Mozilla Foundation, United States; Gesmer Updegrove LLP, United States; Washington State University, United States

DOI: <http://dx.doi.org/10.7554/eLife.16800>

Published July 7, 2016

Cite as eLife 2016;10.7554/eLife.16800



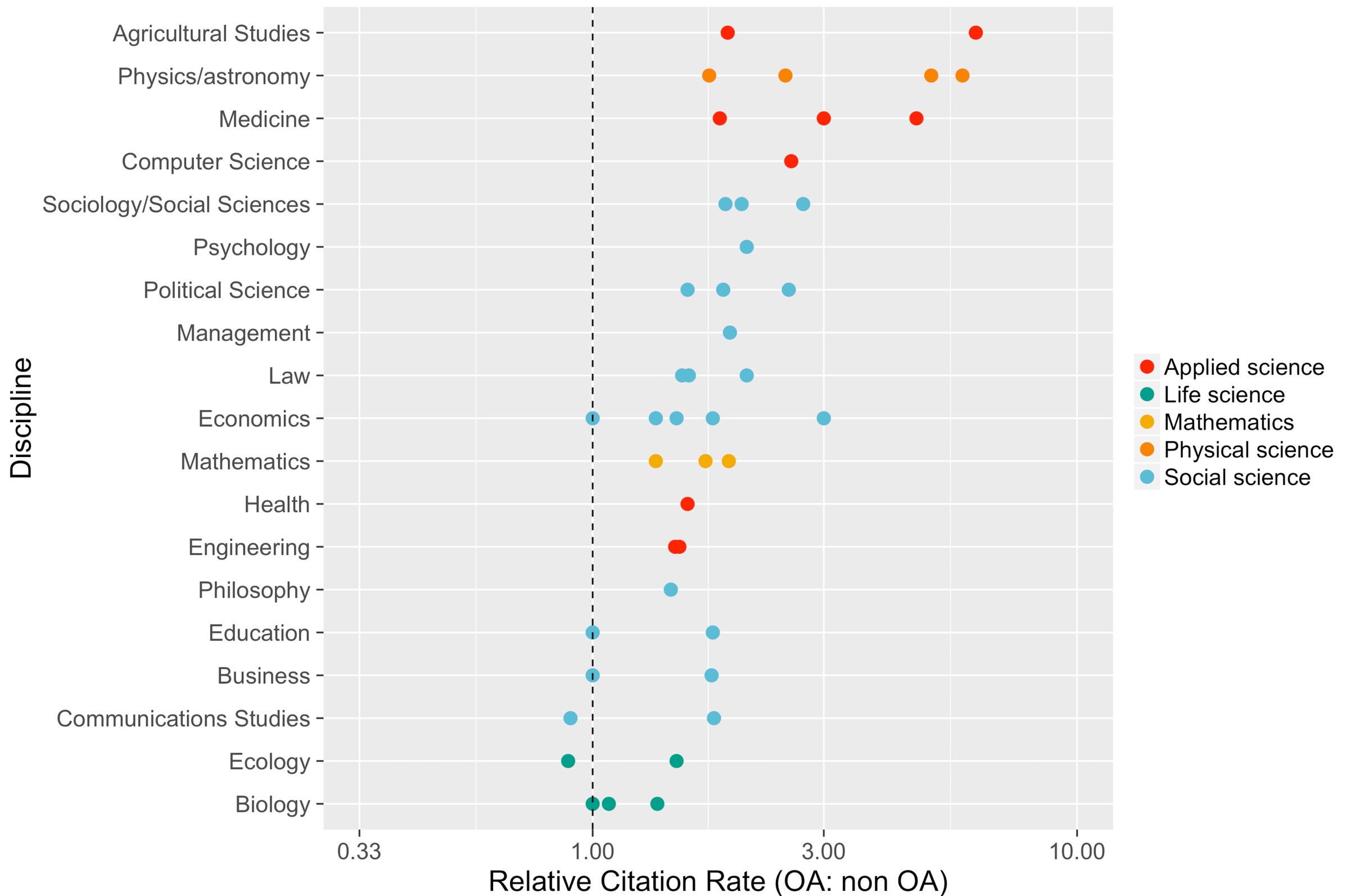
Overview

- open research practices (open access, open data) are growing in popularity and necessity
- but widespread adoption of open research not yet achieved
- researchers are uncertain about how sharing their work will affect their careers
- we review literature demonstrating that open research is associated with increases in citations, media attention, potential collaborators, job opportunities, and funding opportunities

Open practices bring significant benefits to researchers.



Open access articles get more citations



mean citation rate of OA articles divided by mean citation rate of non-OA articles

Preprint servers and repositories accepting preprints



Preprint servers and repositories accepting preprints

Preprint server or repository*	Subject areas	Repository open source?	Public API?	Can leave feedback? [†]	Third party persistent ID?
arXiv arxiv.org	physics, mathematics, computer science, quantitative biology, quantitative finance, statistics	No	Yes	No	No [‡]
bioRxiv biorxiv.org	biology, life sciences	No	No	Yes	Yes (DOI)
CERN document server cds.cern.ch	high-energy physics	Yes (GPL)	Yes	No	No
Cogprints cogprints.org	psychology, neuroscience, linguistics, computer science, philosophy, biology	No	Yes	No	No
EconStor econstor.eu	economics	No	Yes	No	Yes (Handle)
e-LiS eprints.rclis.org	library and information sciences	No [§]	Yes	No	Yes (Handle)
figshare figshare.com	general repository for all disciplines	No	Yes	Yes	Yes (DOI)
Munich Personal RePEc Archive mpra.ub.uni-muenchen.de	economics	No [¶]	Yes	No	No
Open Science Framework osf.io	general repository for all disciplines	Yes (Apache 2)	Yes	Yes	Yes (DOI/ARK)
PeerJ Preprints peerj.com/archives-preprints	biological, life, medical, and computer sciences	No	Yes	Yes	Yes (DOI)
PhilSci Archive philsci-archive.pitt.edu	philosophy of science	No ^{**}	Yes	No	No
Self-Journal of Science www.sjscience.org	general repository for all disciplines	No	No	Yes	No
Social Science Research Network ssrn.com	social sciences and humanities	No	No	Yes	Yes (DOI)
The Winnower thewinnower.com	general repository for all disciplines	No	No	Yes	Yes (DOI) ^{††}
Zenodo zenodo.org	general repository for all disciplines	Yes (GPLv2)	Yes	No	Yes (DOI)

Funding for open research, training, and advocacy

Funding	Description	URL
Shuttleworth Foundation Fellowship Program	funding for researchers working openly on diverse problems	shuttleworthfoundation.org/fellows/
Mozilla Fellowship for Science	funding for researchers interested in open data and open source	www.mozillascience.org/fellows
Leamer-Rosenthal Prizes for Open Social Science (UC Berkeley and John Templeton Foundation)	rewards social scientists for open research and education practices	www.bitss.org/prizes/leamer-rosenthal-prizes/
OpenCon Travel Scholarship (Right to Research Coalition and SPARC)	funding for students and early-career researchers to attend OpenCon, and receive training in open practices and advocacy	www.opencon2016.org/
Preregistration Challenge (Center for Open Science)	prizes for researchers who publish the results of a preregistered study	cos.io/prereg/
Open Science Prize (Wellcome Trust, NIH, and HHMI)	funding to develop services, tools, and platforms that will increase openness in biomedical research	www.openscienceprize.org/



SHUTTLEWORTH
FOUNDATION



mozilla
Science Lab



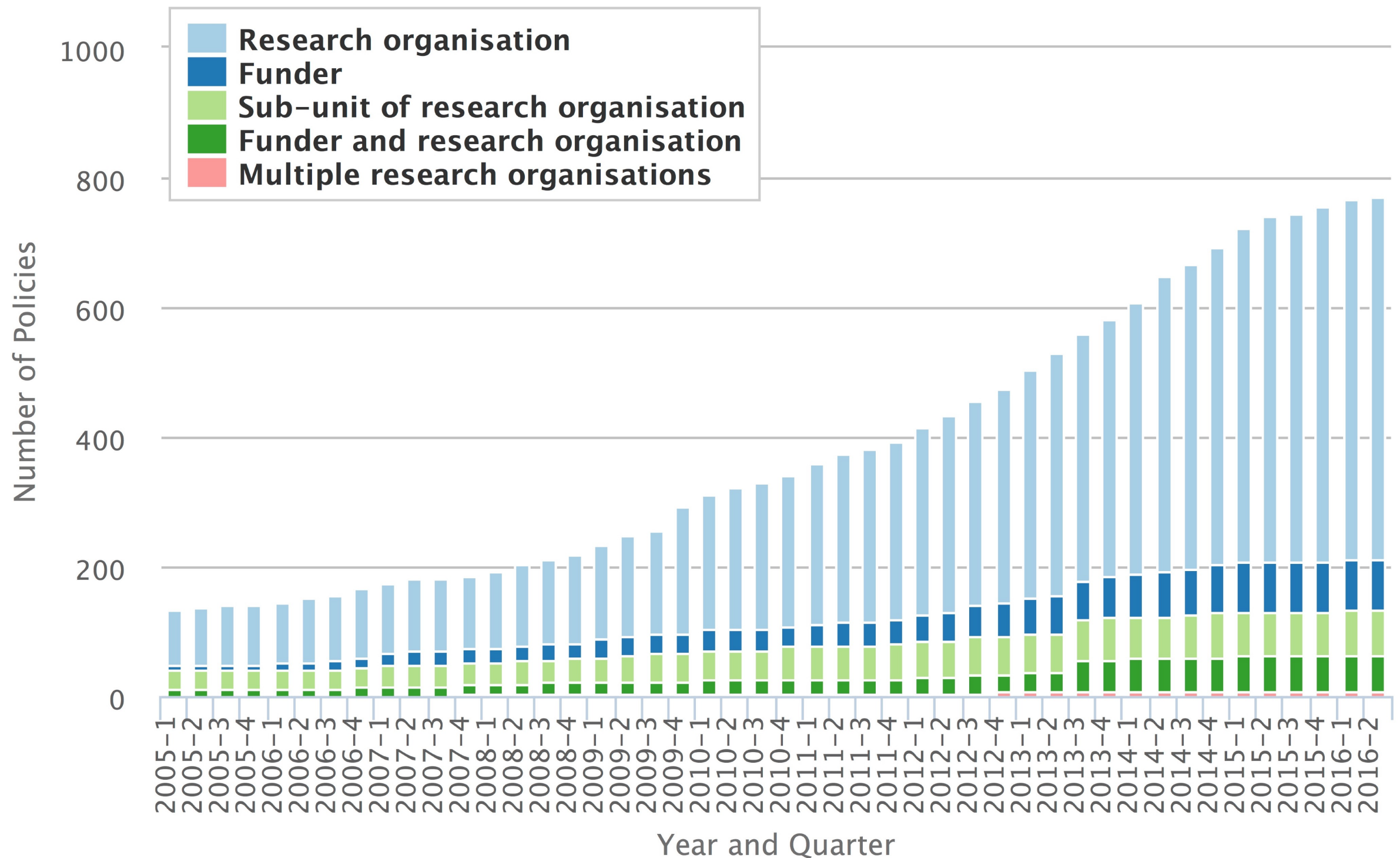
OPENCON2016

Empowering the Next Generation to Advance
Open Access, Open Education and Open Data



The
Open
Science
Prize

Increase in open access policies over last decade



- open access policies registered in ROARMAP (roarmap.eprints.org)
- figure used with permission from Stevan Harnad

Box 1: What can I do right now?

Engaging in open science need not require a long-term commitment or intensive effort. There are a number of practices and resolutions that researchers can adopt with very little effort that can help advance the overall open science cause while simultaneously benefiting the individual researcher.

1. **Post free copies of previously published articles in a public repository.** Over 70% of publishers allow researchers to post an author version of their manuscript online, typically 6-12 months after publication (see § 2.5).
2. **Deposit preprints of all manuscripts in publicly accessible repositories** as soon as possible – ideally prior to, and no later than, the initial journal submission (see § 2.5.2).
3. **Publish in open access venues** whenever possible. As discussed in § 2.3, this need not mean forgoing traditional subscription-based journals, as many traditional journals offer the option to pay an additional charge to make one's article openly accessible.
4. **Publicly share data and materials via a trusted repository.** Whenever it is feasible, the data, materials, and analysis code used to generate the findings reported in one's manuscripts should be shared. Many journals already require authors to share data upon request as a condition of publication; pro-actively sharing data can be significantly more efficient, and offers a variety of other benefits (see § 4).
5. **Preregister studies.** Publicly preregistering one's experimental design and analysis plan in advance of data collection is an effective means of minimizing bias and enhancing credibility (see § 6.1). Since the preregistration document(s) can be written in a form similar to a Methods section, the additional effort required for preregistration is often minimal.

What can I do right now to share my research?

- Post free copies of previously published articles in a public repository
- Deposit preprints of all manuscripts in publicly accessible repositories
- Publish in open access venues
- Publicly share data and materials via a trusted repository
- Preregister studies

Openness is defined by a continuum of practices - there are so many ways to share your research.



Summary

In his 2012 book *Open Access*, Peter Suber summed it up best:

“[OA] increases a work’s visibility, retrievability, audience, usage, and citations, which all convert to career building. For publishing scholars, it would be a bargain even if it were costly, difficult, and time-consuming. But...it’s not costly, not difficult, and not time-consuming.”

Suber P. 2012. *Open Access*. MIT Press. <http://bit.ly/oa-book>