



# A brief history and a look at the future of Open Access

– or why progress in one of the most important revolutions in scientific communication has been so slow

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Presentation at Åbo Akademi 21.10.2019  
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# The problem we are facing – artificial barriers to research being used



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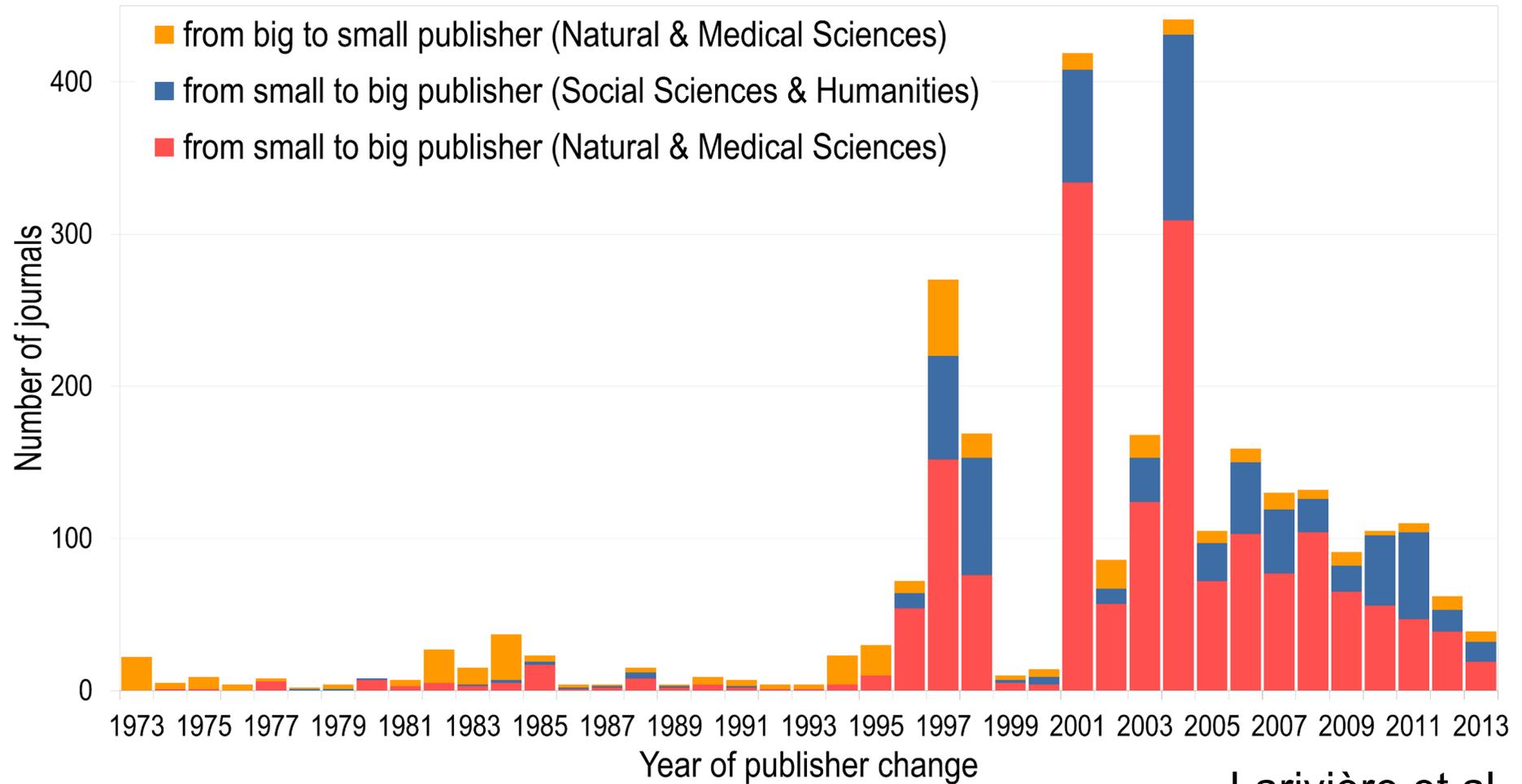
*When did scholarly publishing take the wrong turn?*



# *...around 1996*



HANKEN



Larivière et al. (2015)

*The five largest publishers now publish around half of all scholarly journals*



**SPRINGER NATURE**

**WILEY**

**SAGE**  
Publishing



Taylor & Francis Group  
an **informa** business



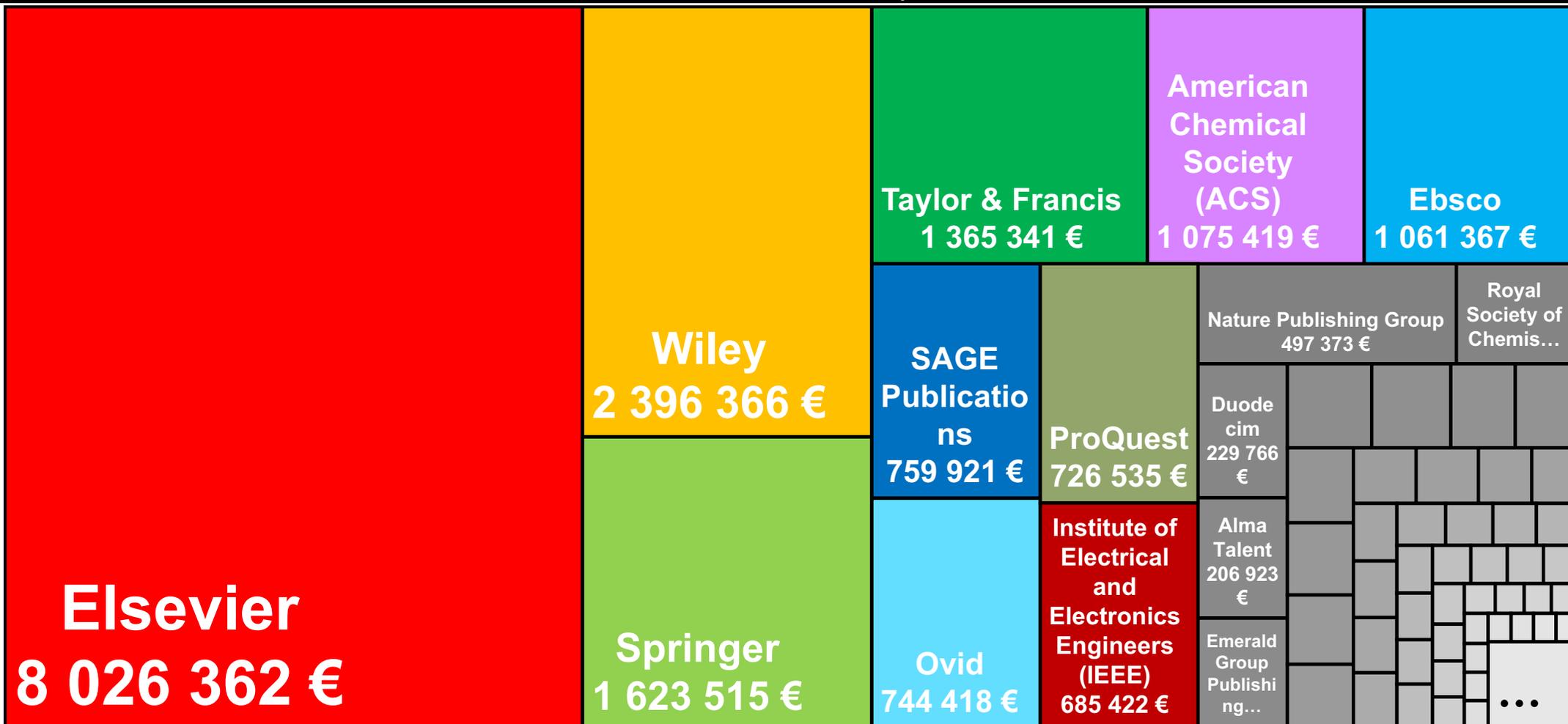
**ELSEVIER**

# Amounts paid by FinElib 2017



<https://avointiede.fi/tiedonkeruu2018>

HANKE N



# *A hard fact*

- » **Commercial companies**, particularly publicly traded, **are out to increase profits and seek growth.**
- » That is what makes shareholders happy and the leadership of the companies keep their jobs.
- » This growth can come from expanding business into new areas, or it can come from increasing market share and/or prices in existing segments.



<https://www.change.org/p/elsevier-boycott-elsevier-and-support-affordable-open-access-scholarly-publishing/sign>



# *Market control is not on the buyer side*



- » Each journal (and thus publisher) essentially a monopoly.
- » Publication outlet rank deeply entangled in academic merit systems.
- » Content supply disconnected from purchasing decision.
- » Decoupled buyer and primary end-customer.
- » Still mostly non-transparent pricing and contract terms.
- » Pricing extrapolated from historical spending.
- » De-synced international negotiation schedules.
- » .....



# *Historical context*



- » The evolution of scholarly communication has closely followed the overall developments of internet technologies
- » Now only a fraction of journals are purchased in paper format to be part of permanent library collections
- » Subscriptions delivered as licenses to access digital archives rather than purchasing the content outright
- » From individual subscriptions to large consortia deals



The Open Access Directory – Timeline before 2000

[http://oad.simmons.edu/oadwiki/Timeline\\_before\\_2000](http://oad.simmons.edu/oadwiki/Timeline_before_2000)



# Open Access



*“Open access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions.”*

(Peter Suber, 2012:4)

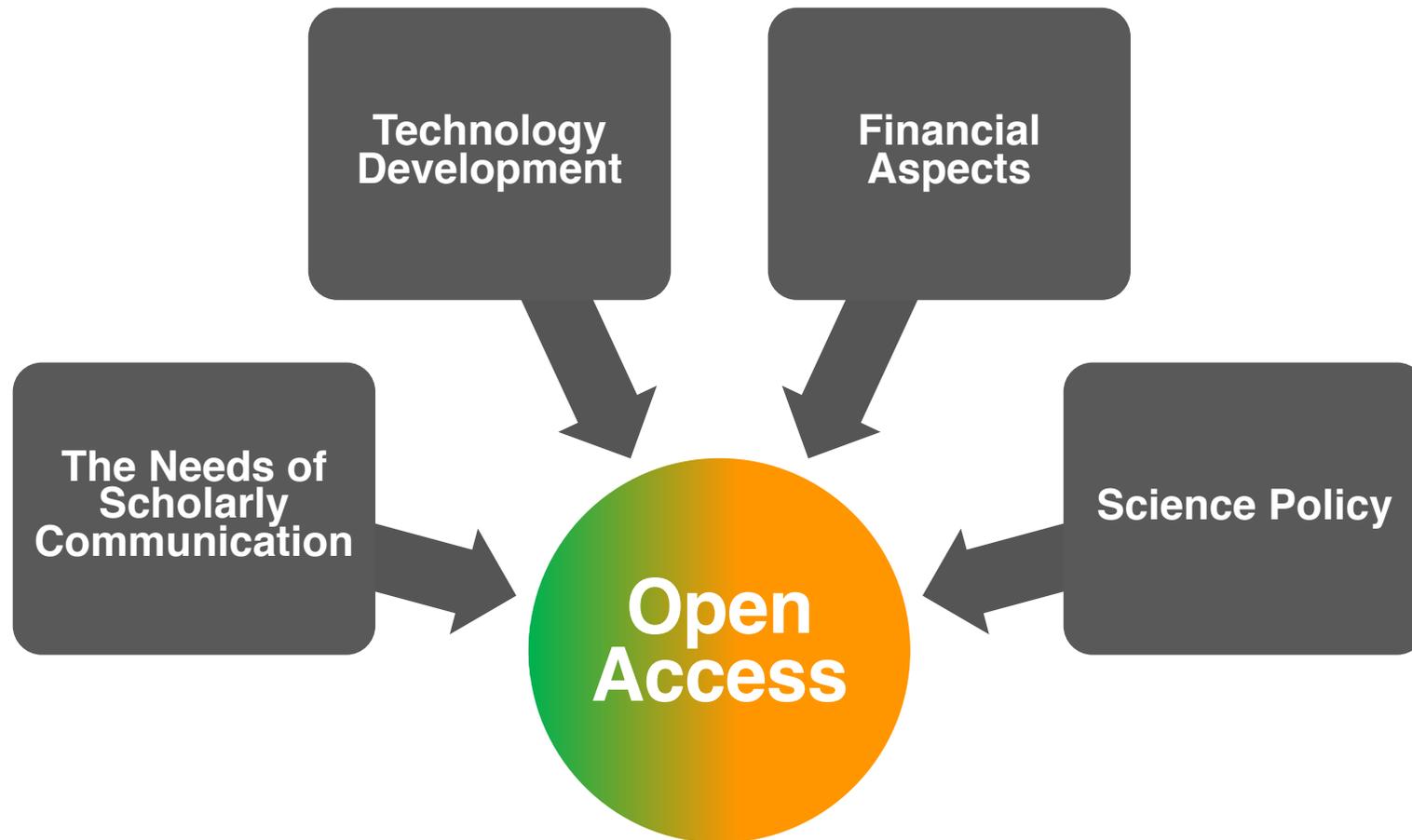
## Gold OA

Open Access made available by journals themselves (either in full or part). Free for everyone or enabled by author-side payment.

## Green OA

Open Access elsewhere on the web. Often manuscript-versions of published journal articles. Free to authors.

# *Open Access is constantly evolving*



# OA started to gain steam in 2002-2003 with Europe being a key locus for support towards an OA future



HANKEN

## Budapest Open Access Initiative

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[BOAI10 Recommendations](#)

[Translations](#)

[Background](#)

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### Read the Budapest Open Access Initiative

An old tradition and a new technology have converged to make possible an unprecedented public good. The old tradition is the willingness of scientists and scholars to publish the fruits of their research in scholarly journals without payment, for the sake of inquiry and knowledge. The new technology is the internet. The public good they make possible is the world-wide electronic distribution of the peer-reviewed journal literature and completely free and unrestricted access to it by all scientists, scholars, teachers, students, and other curious minds. Removing access barriers to this literature will accelerate research, enrich education, share the learning of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and lay the foundation for uniting humanity in a common intellectual conversation and quest for knowledge.

For various reasons, this kind of free and unrestricted online availability, which we will call **open access**, has so far been limited to small portions of the journal literature. But even in these limited collections, many different initiatives have shown that open access is economically feasible, that it gives readers extraordinary power to find and make use of relevant literature, and that it gives authors and their works **vast and measurable** new **visibility, readership, and impact**. To secure these benefits for all, we call on all interested institutions and individuals to help open up access to the rest of this literature and remove the barriers, especially the price barriers, that stand in the way. The more who join the effort to advance this cause, the sooner we will all enjoy the benefits of open access.

## Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities

### Preface

The Internet has fundamentally changed the practical and economic realities of distributing scientific knowledge and cultural heritage. For the first time ever, the Internet now offers the chance to constitute a global and interactive representation of human knowledge, including cultural heritage and the guarantee of worldwide access.

We, the undersigned, feel obliged to address the challenges of the Internet as an emerging functional medium for distributing knowledge. Obviously, these developments will be able to significantly modify the nature of scientific publishing as well as the existing system of quality assurance.

In accordance with the spirit of the Declaration of the Budapest Open Access Initiative, the ECHO Charter and the Bethesda Statement on Open Access Publishing, we have drafted the Berlin Declaration to promote the Internet as a functional instrument for a global scientific knowledge base and human reflection and to specify measures which research policy makers, research institutions, funding agencies, libraries, archives and museums need to consider.

## Bethesda Statement on Open Access Publishing

*Released June 20, 2003*

### Contents

- [Summary of the April 11 meeting](#)
- [Definition of open access publication](#)
- [Statement of the Institutions and Funding Agencies working group](#)
- [Statement of the Libraries & Publishers working group](#)
- [Statement of Scientists and Scientific Societies working group](#)
- [List of participants](#)

### Summary of the April 11, 2003, Meeting on Open Access Publishing

The following statements of principle were drafted during a one-day meeting held on April 11, 2003 at the headquarters of the Howard Hughes Medical Institute in Chevy Chase, Maryland. The purpose of this document is to stimulate discussion within the biomedical research community on how to proceed, as rapidly as possible, to the widely held goal of providing open access to the primary scientific literature. Our goal was to agree on significant, concrete steps that all relevant parties – the organizations that foster and support scientific research, the scientists that generate the research results, the publishers who facilitate the peer-review and distribution of results of the research, and the scientists, librarians and other who depend on access to this knowledge – can take to promote the rapid and efficient transition to open access publishing.

A list of the attendees is given following the statements of principle; they participated as individuals and not necessarily as representatives of their institutions. Thus, this statement, while reflecting the group consensus, should not be interpreted as carrying the unqualified endorsement of each participant or any position by their institutions.

# What OA looks like on Google Scholar



Google

Scholar About 126,000 results (0.12 sec)

**Articles**

Case law

My library

Any time

Since 2017

Since 2016

Since 2013

Custom range...

Sort by relevance

Sort by date

include patents

include citations

Create alert

**Fish consumption, fish oils, and cardiovascular events: still waiting for definitive evidence**  
[PM Ridker](#) - *The American Journal of Clinical Nutrition*, 2016 - *Am Soc Nutrition*  
← 1 Allaire J, Couture P, Leclerc M, Charest A, Marin J, Lépine MC, Talbot D, Tchernof A, Lamarche B. A randomized, crossover, head-to-head comparison of eicosapentaenoic acid and docosahexaenoic acid supplementation to reduce inflammation markers in men and  
Related articles All 2 versions Cite Save

**Trends in blood mercury concentrations and fish consumption among US women of reproductive age, NHANES, 1999–2010**  
[RJ Birch](#), [J Bigler](#), [JW Rogers](#), [Y Zhuang](#)... - *Environmental ...*, 2014 - *Elsevier*  
Background **Consumption** of finfish and shellfish is the primary exposure pathway of methylmercury (MeHg) in the US. MeHg exposure in utero is associated with neurodevelopmental and motor function deficits. Regulations and **fish** advisories may  
Cited by 26 Related articles All 9 versions Cite Save

**No association between fish consumption and risk of stroke in the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Spain): a ...**  
[P Amiano](#), [S Chamosa](#), [N Etxezarreta](#)... - *Public health ...*, 2016 - *Cambridge Univ Press*  
Objective To prospectively assess the associations between lean **fish**, fatty **fish** and total **fish** intakes and risk of stroke in the Spanish cohort of the European Prospective Investigation into Cancer and Nutrition (EPIC-Spain). Design **Fish** intake was estimated from a validated  
Related articles All 6 versions Cite Save

**Regular fish consumption and age-related brain gray matter loss**  
[CA Raji](#), [KI Erickson](#), [OL Lopez](#), [LH Kuller](#)... - *American journal of ...*, 2014 - *Elsevier*  
Background Brain health may be affected by modifiable lifestyle factors; consuming **fish** and antioxidative omega-3 fatty acids may reduce brain structural abnormality risk. Purpose To determine whether dietary **fish consumption** is related to brain structural integrity among  
Cited by 34 Related articles All 10 versions Cite Save

[\[HTML\] infona.pl](#)

[\[PDF\] cambridge.org](#)

[\[HTML\] nih.gov](#)

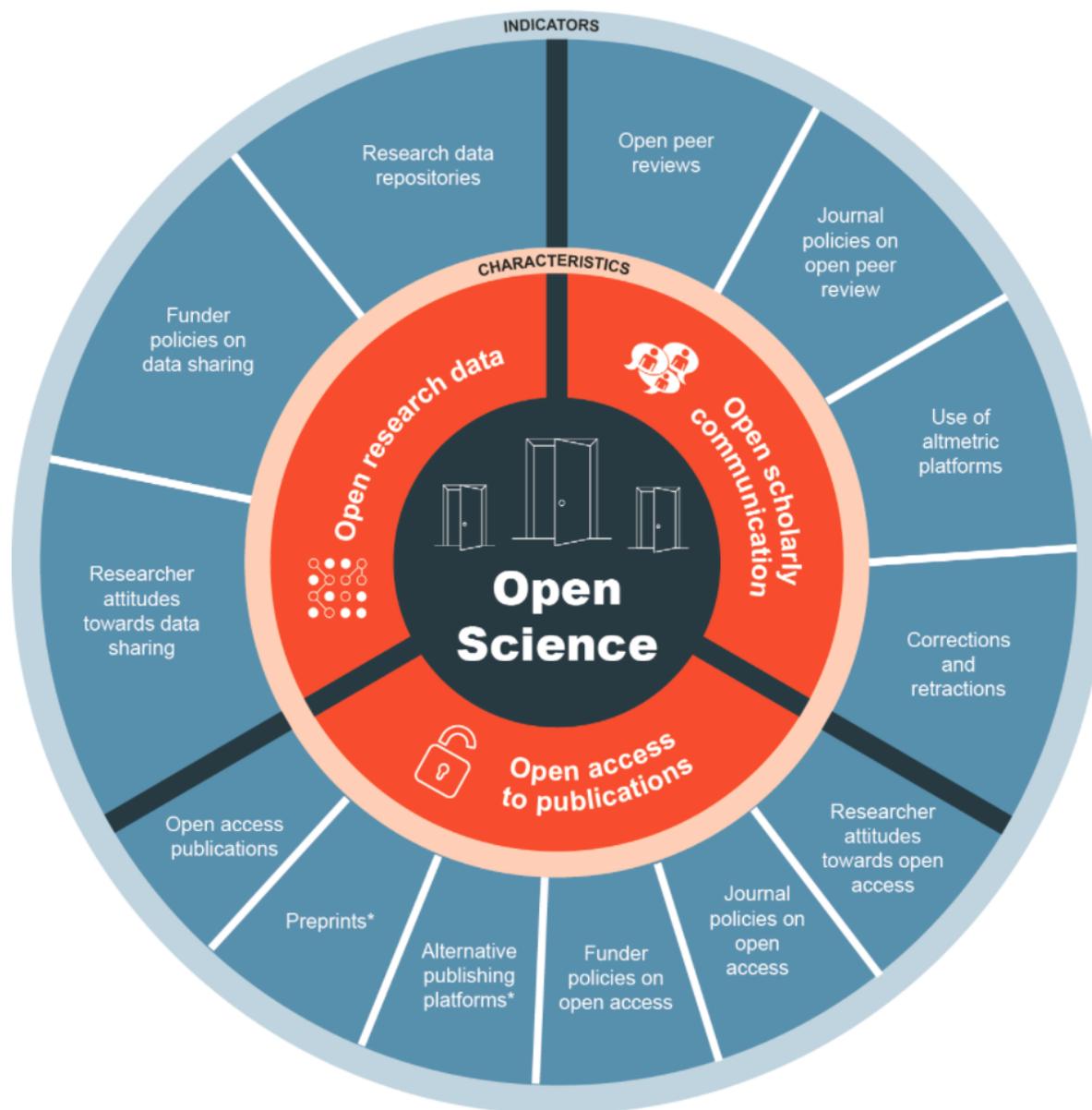


Image: <https://ec.europa.eu/research/openscience/index.cfm?pg=home&section=monitor>



# *The uphill starting position of open access*



- » **Major publishers having no reason to hurry**
  - » Market-controlling power over journal portfolios
  - » Economies of scale in digital publishing
- » **Academic merit systems**
  - » Academics work hard to get published/gain positions on editorial boards
  - » Establishing new journals takes time
- » **Universities/libraries unable to act aggressively**
  - » Subscriptions increasingly expensive, no money left over to support alternative publishing models

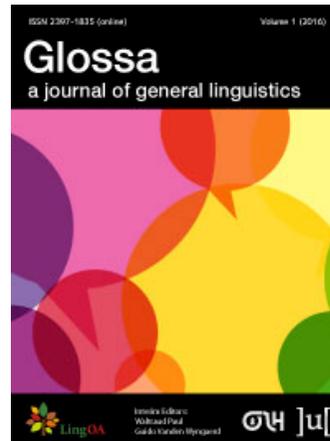
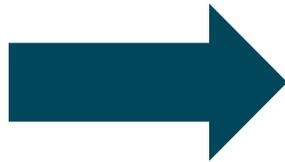


*The general landscape of journals , particularly within social science, and the arts and humanities*



- » Journals have formed very strong communities and have respected seniority hierarchies.
- » Generally "slow science", long review times, multiple revision rounds, long times permitted to submit revisions.
- » One or two articles in the right journal can make or break an academic career. Outlet-based research evaluation.
- » External funders and their policies not as effective as in many other disciplines.

# *It is possible: Editorial boards abandoning leading journals, “declaring independence”*



It's ultimately the scholars that have the power for enabling change but coordinated effort is needed.

# *OA still has some way to go*



HANKEN

- » During 2016, 67 236 cancer news stories linked to 11,523 different journal articles.
- » 60% of links to reported research behind paywalls.

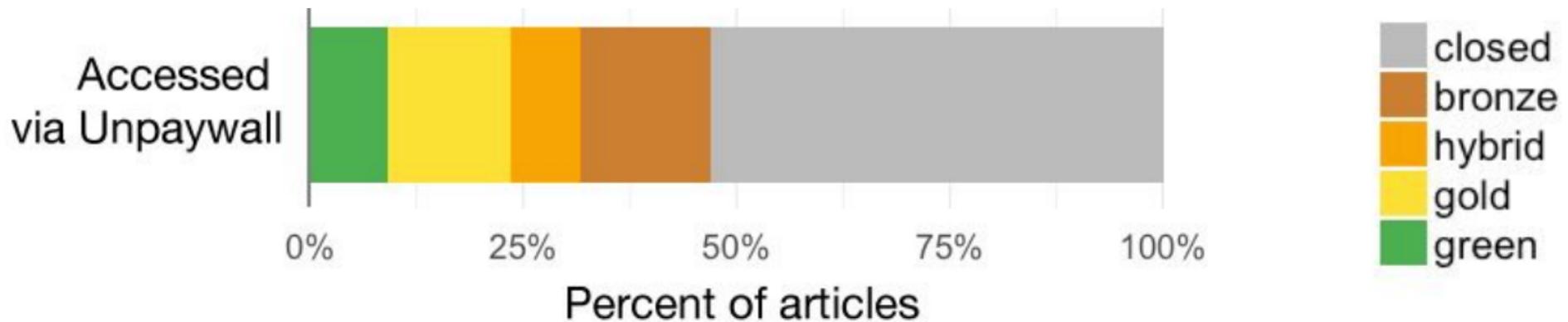
## Can Your Doctor See the Cancer Research Reported in the News? Can you?



Authors: [Lauren Maggio](#), [Juan Pablo Alperin](#), [Laura Moorhead](#), [John Willinsky](#)

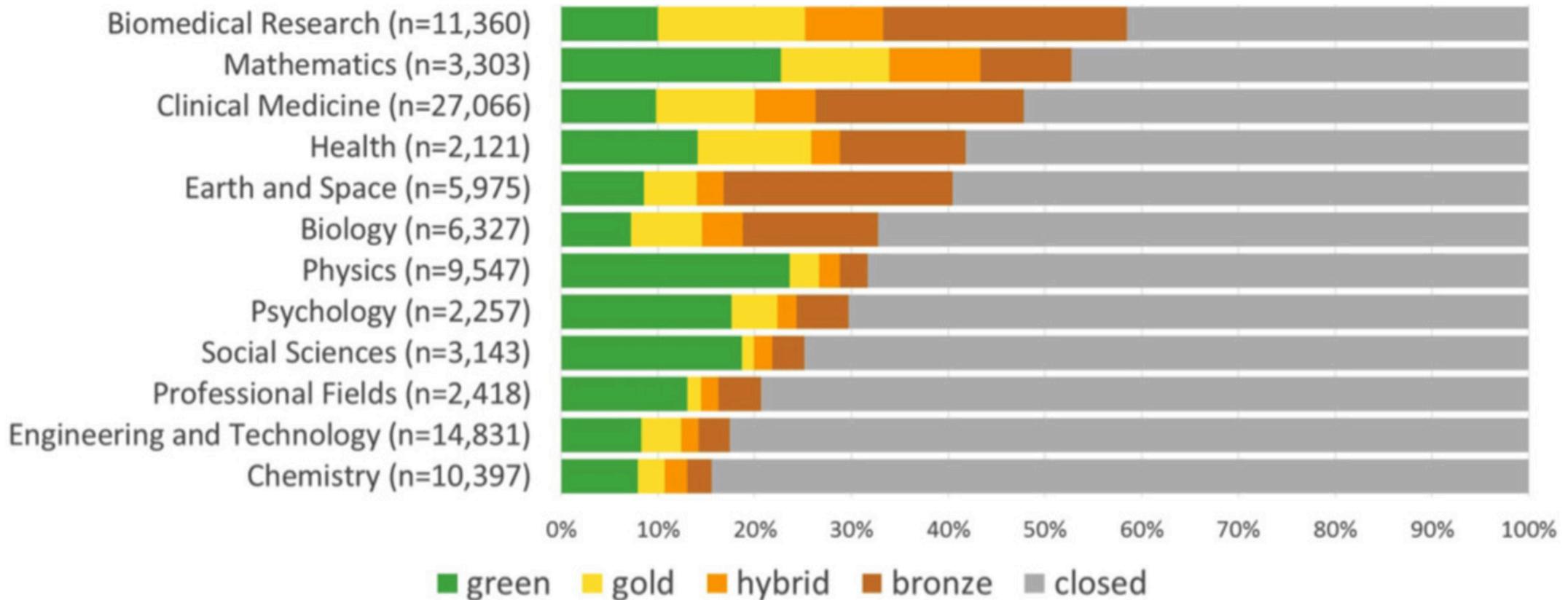
<https://medium.com/@lauren.maggio01/can-your-doctor-see-the-cancer-research-reported-in-the-news-can-you-beb9270c301f#.ijeo0f9lq>

*The current landscape of OA is complicated,  
but around 50% of recent articles are OA*



Piwowar et al (2018)

# Discipline differences



Piwowar et al (2018)

# *Illegal access is not a long-term solution*



- » Provides access to more than **58,000,000** articles and growing.



“Over the 6 months leading up to March, Sci-Hub served up 28 million documents, with Iran, China, India, Russia, and the United States the leading requestors.”

Bohannon (2016)



# *European Union and OA*



- » The EU has long been a supporter of OA, started with limited OA pilot in the 7<sup>th</sup> Framework funding programme (2007-2013)
- » The publications resulting from Horizon 2020 funding are required to be made available OA either as green OA or gold OA
- » OpenAIRE
- » PASTEUR4OA - Open Access Policy Alignment Strategies for European Union Research
- » FOSTER - Facilitate Open Science Training for European Research
- » Through the the Competitiveness Council, EU member states agreed in May 2016 that all journal articles should be OA by 2020.



## Guidelines to the Rules on Open Access to Scientific Publications and Open Access to Research Data in Horizon 2020

### 3. MANDATE ON OPEN ACCESS TO PUBLICATIONS

[Article 29.2](#) of the Model Grant Agreement sets out detailed legal requirements on open access to scientific publications: under Horizon 2020, **each beneficiary must ensure open access to all peer-reviewed scientific publications** relating to its results.

To meet this requirement, beneficiaries must, at the very least, ensure that any scientific peer-reviewed publications can be read online, downloaded and printed.

Since any further rights - such as the right to copy, distribute, search, link, crawl and mine - make publications more useful, beneficiaries should make every effort to provide as many of these options as possible.



ACADEMY OF FINLAND

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### Open access publishing

The Academy of Finland is keen to stress the importance of quality in scientific publishing. We require that Academy-funded researchers make sure that publications produced with Academy funding are made openly available, where possible, *by storing parallel copies in machine-readable formats in suitable repositories or databases*. The publications should be available free of charge.

Articles can also be published in open access publication series, whereby the publisher is responsible for making the articles openly available. We recommend that researchers publish articles following either green or gold open access.

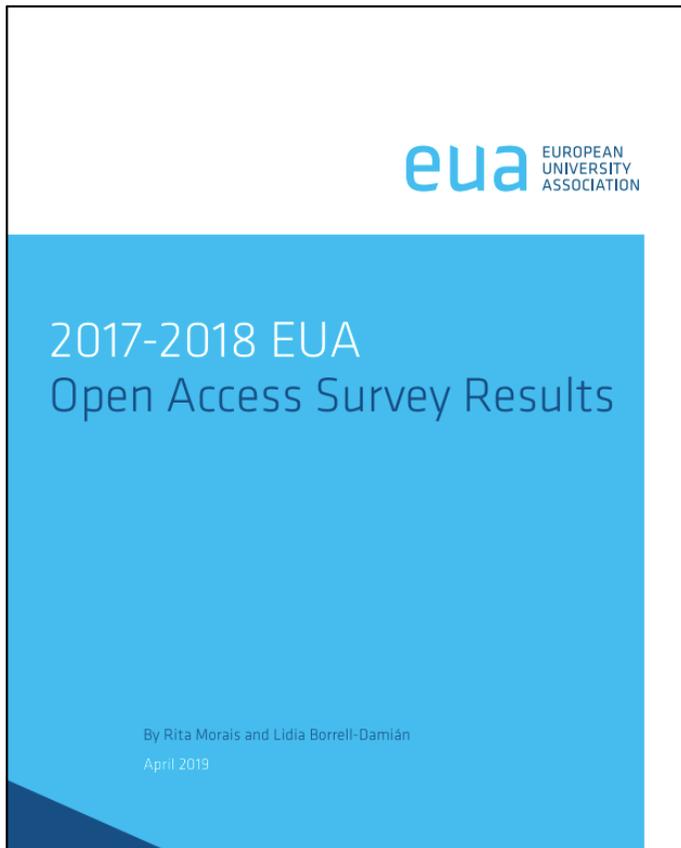
<http://www.aka.fi/en/funding/how-to-apply/application-guidelines/open-science/>

# *Plan S – Nothing to panic about*

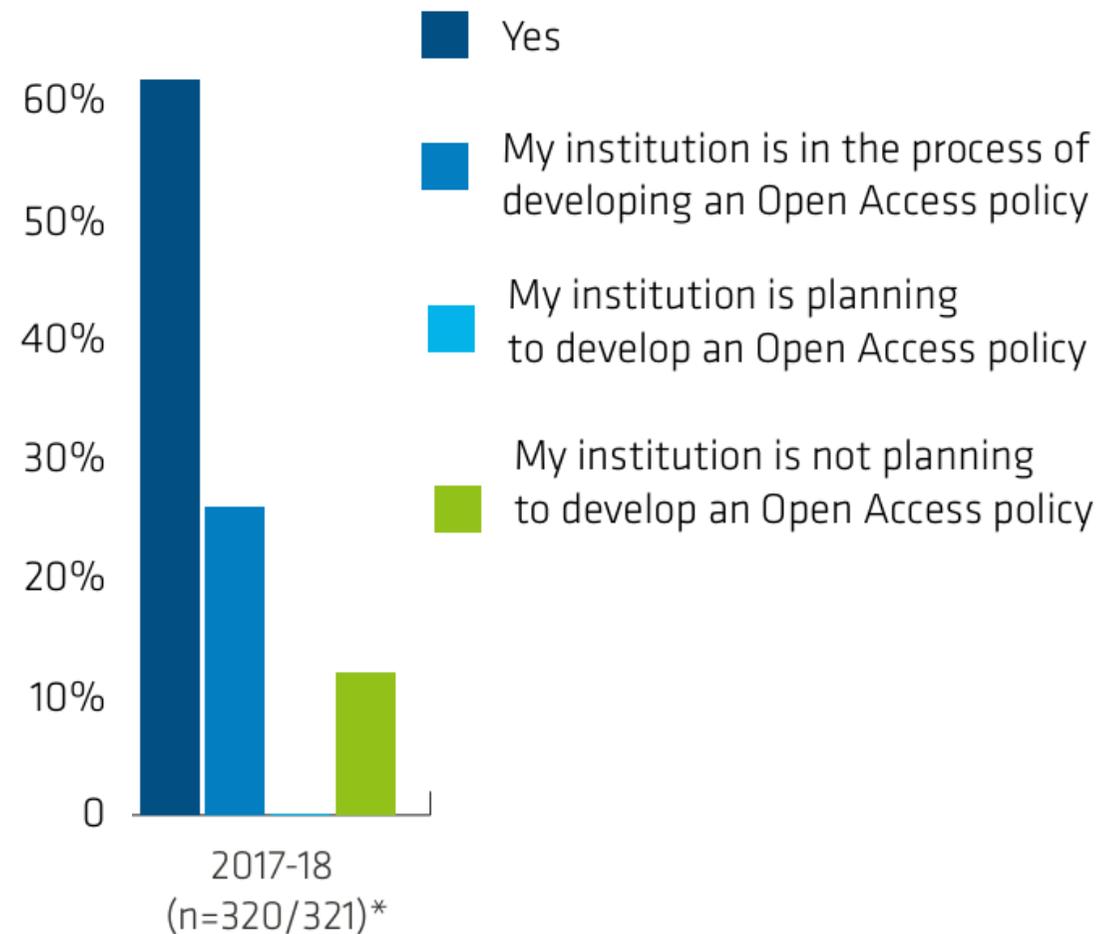


- » Plan S is an initiative for Open Access publishing that was launched in September 2018. The plan is supported by cOAlition S, an international consortium of research funders. Plan S requires that, from 2021, scientific publications that result from research funded by public grants must be published in compliant Open Access journals or platforms.

# *The majority of European institutions already have an open access policy in place*



<https://eua.eu/resources/publications/826:2017-2018-eua-open-access-su>





# *Åbo Akademi also has one*



## **GUIDLINES FOR OPEN ACCESS PUBLISHING**

1. Scientists at Åbo Akademi publish their research in peer-reviewed scientific publications of high quality within their own discipline. As scientific publications are considered articles in scientific journals, serials, books, conference publications, reprints and theses for Master's degree, licentiate degree and doctoral degree.

2. Scientific publications produced at Åbo Akademi University are made as openly available as possible, considering the publisher's terms and conditions, as well as current legislation and agreements.

3. Åbo Akademi University recommends publishing in peer reviewed Open Access journals of high quality (i.e. gold open access).

4. Scientific publications are published as open access in the Åbo Akademi University Library archive always when the publisher's terms and conditions allow this (i.e. green open access).

<http://blogs2.abo.fi/opensciencepolicy/2017/03/02/open-science-at-aau-university/>

In interviews I've conducted with faculty, there is still a clear lack of awareness of open access



Awareness

Attitudes

Motivations

Routines





## *Explanations for lack of self-archiving manuscripts in the institutional repository*



“I don’t have enough time.

“I co-authored the article, I do not have the most recent manuscript version.”

“Publication is enough for me, I do not care about wider dissemination.”

“I immediately delete all manuscript files from my computer once the article is published.”

“No one would ever find it in the institutional repository.”

“I am uncertain about what I am allowed to distribute.”

“Manuscript versions are inferior to the published article.”

“Readers would be confused about how to cite the article.”

“I already use other services to disseminate my research outputs.”

Academic social networks are not platforms for providing sustainable open access



Academia.edu  
share research

ResearchGate

Subject-based repositories are also good locations to self-archive manuscripts



zenodo

bioRxiv

Cogprints

arXiv.org

SOCARXIV  
open archive of the social sciences



*Open Access benefits =  
just research doing what it should*



- » OA offers the “normal” way of disseminating research, without artificial barriers to access.
- » As such I argue that OA is the default mode for research – the situation we currently are in is due to legacy structures from the paper-based past.

# Visibility and impact increase



- » **Citation advantage** compared to articles only available through subscription-access. (McKiernan et al 2016)
- » “[...] the odds that an open access journal is referenced on the English **Wikipedia** are 47% higher compared to paywall journals.” (Teplitskiy, Lu & Duede 2016)
- » In a study covering over 1700 articles published in Nature Communications, **OA articles received 2.5-4.4 times the interactions on Twitter and Facebook** compared to closed-access articles. (Wang, Liu, Mao & Fang 2015).
- » **OA also benefits journals**, it is just that fully embracing the model is currently in tension with maximizing business interests.

# OA benefits are colourblind



- » What matters is that the research publication is discoverable and retrievable without reader-side payment.
- » The mechanism through which this happens is not a main concern for gaining benefits.
- » However, the earlier OA is provided the better.





# *Readers outside of academia*

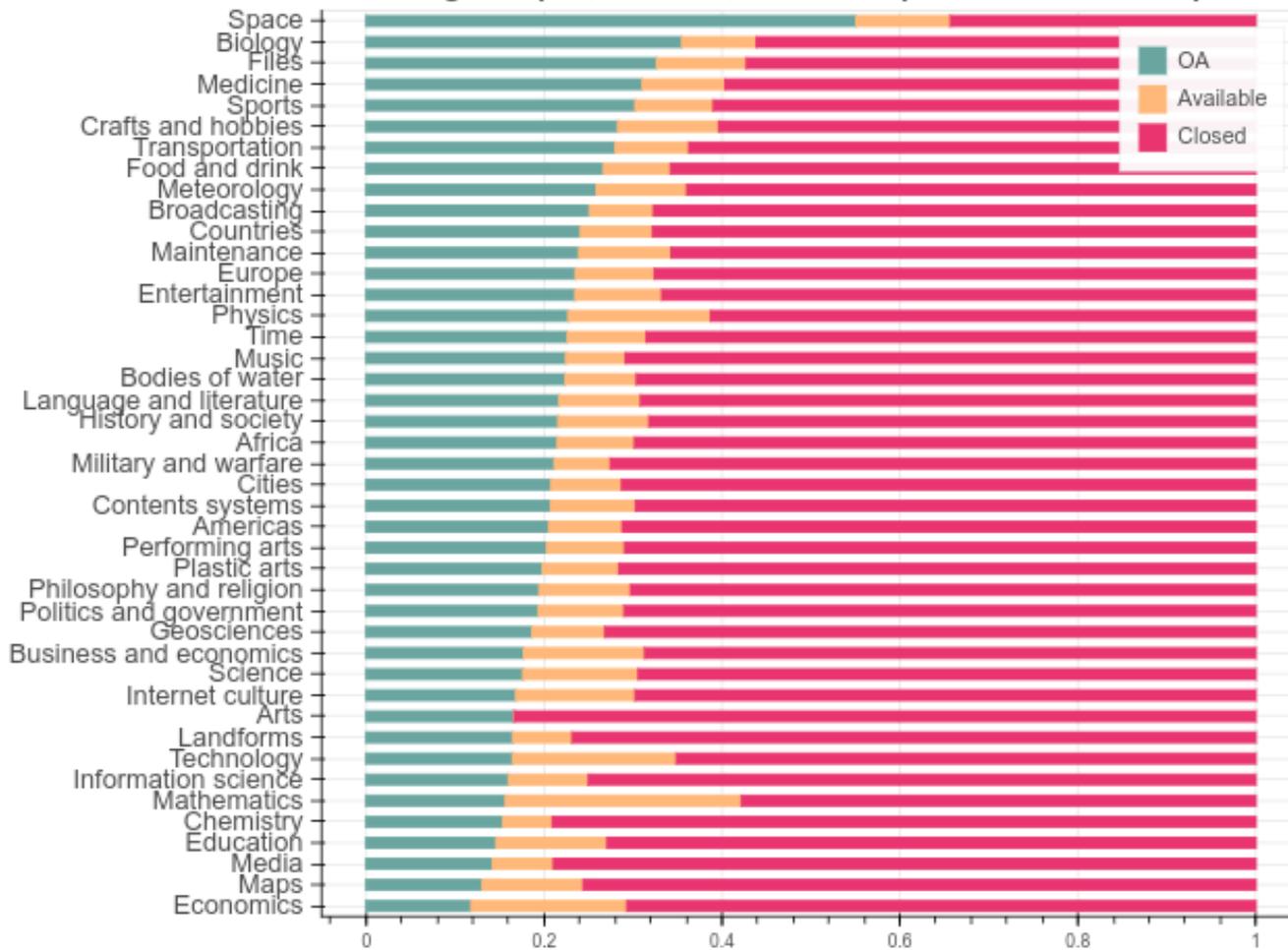


- » **Citizens and society as a whole benefits**
- » Research is not “walled off” from the general public.
- » “Those who invest in and benefit from primary research, including the general public, have an interest in improvements to the quality of that research.”  
(Zuccalá 2009)
- » Increased potential for in fostering science literacy.

# *On that note, how large a share of article references in Wikipedia are currently OA?*



Percentage of open, available, and closed publications for all topics



<https://wikimediafoundation.org/2018/08/20/how-many-wikipedia-references-are-available-to-read/#content>



# *Researchers looking for information*



- » **Ubiquitous access**
  - » No logins, no proxies...
  - » Easy cross-device access
  - » No need for publisher-specific search tools
- » **All researchers in the world have access to the same scientific information**
- » **Use of unified search and discovery services**

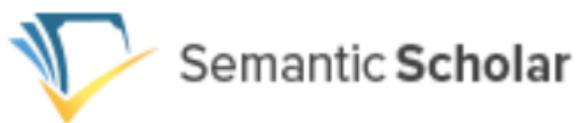
*Web services built upon and enhanced by more open metadata APIs and/or open access*



Microsoft Academic



Yewno



IRIS.AI



JOURNAL.FI

Finnish Scholarly Journals Online

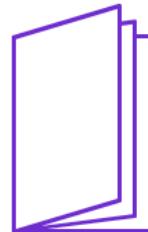
Search for articles...



## Recent issues



Agricultural and  
Food Science  
VOL 27 NO 3 (2018)



Terra  
VOL 130 NO 1 (2018)



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Lähikuva – audiovi-  
suaalisen kulttuurin  
tieteellinen julkaisu  
VOL 31 NO 2 (2018)



Idäntutkimus  
VOL 25 NO 2 (2018)



Journal of Structural  
Mechanics  
VOL 51 NO 1 (2018)

# Universities

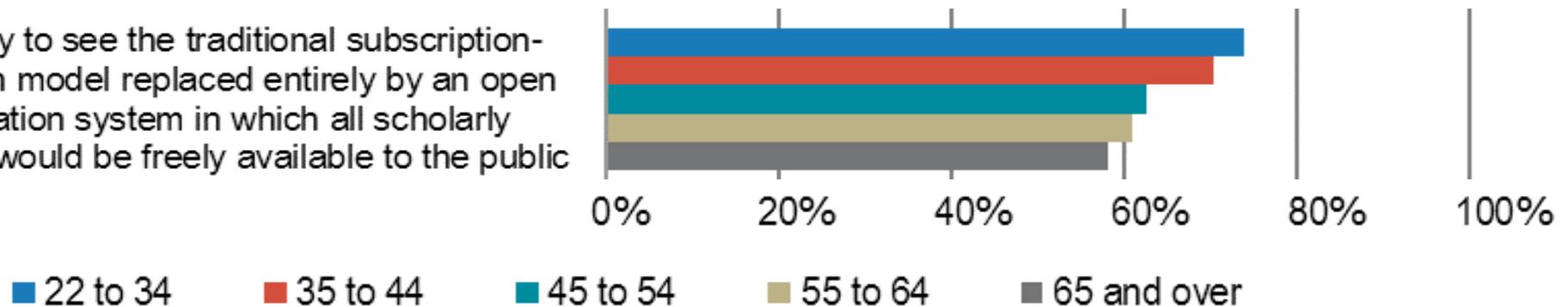


- » **Open Access enables universities to:**
- » Make works more visible and accessible, thus increasing the impact of all conducted research.
- » Retain control and ownership of research outputs that are produced.
- » Start collecting an organisational “memory”.
- » Facilitate a transition away from ever-increasing publisher subscription fees.

*It has been found that in particular early-career researchers, want to see change in the publication model*

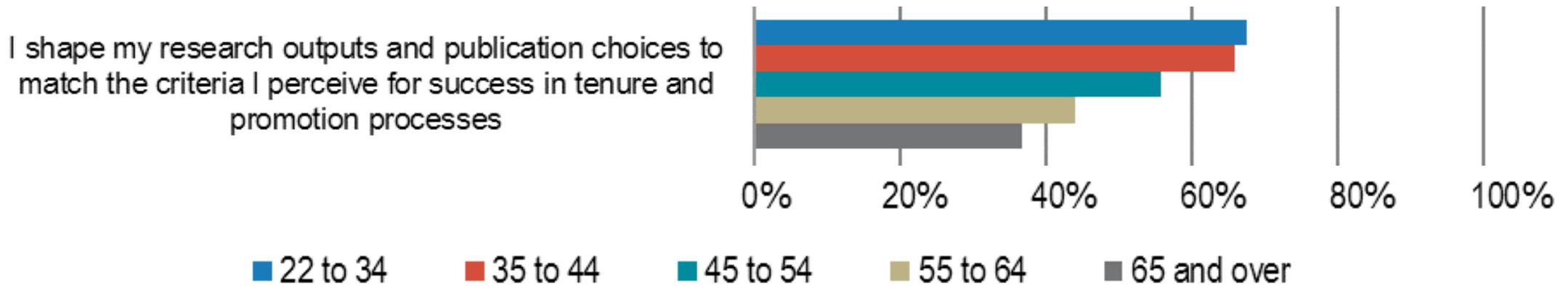


I would be happy to see the traditional subscription-based publication model replaced entirely by an open access publication system in which all scholarly research outputs would be freely available to the public



Percent of respondents who strongly agreed with this statement. <https://sr.ithaka.org/publications/2018-us-faculty-survey/>

*But at the same time, existing reward systems guide in particular the research and publication behaviors of younger faculty*



Percent of respondents who strongly agreed with this statement. <https://sr.ithaka.org/publications/2018-us-faculty-survey/>



# *Researchers are in general risk averse when it comes to merit accumulation*

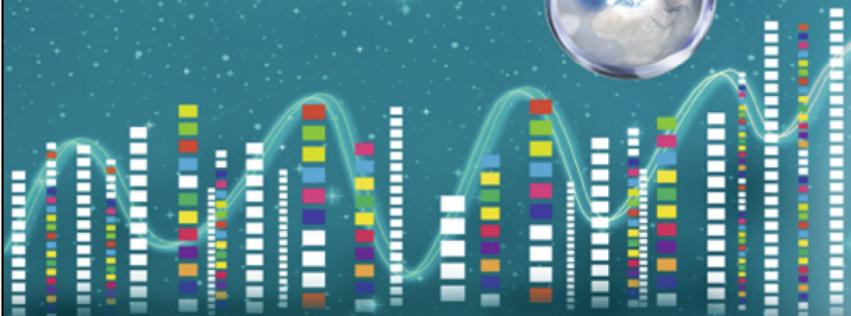


- » Short-term employment with a strong "up-or-out" principle guides a lot of decision-making among researchers.
  - » (e.g. in Finland 70% of research and teaching staff is non-permanent).
- » Primary focus on established mechanisms and criteria for accumulating merit.
- » Only after that can one be more adventurous, if there is any energy or sanity left.
- » **The decisions, needs, and priorities of researchers are balancing between short- and long-term (primarily individual) interests.**



# Future of Scholarly Publishing and Scholarly Communication

*Report of the Expert Group to  
the European Commission*



January 2019

Research and  
innovation

“

...nothing will do more to foster change in accordance with the principles set out in this report than concerted work and institutional change in the area of rewards and incentives.

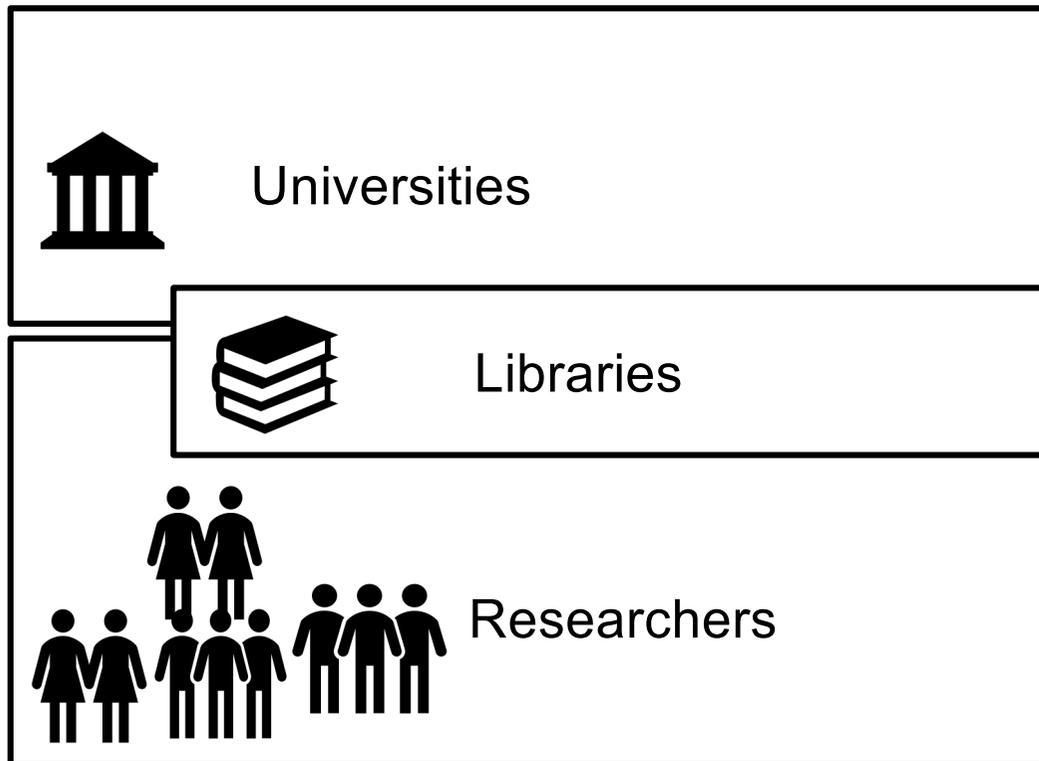
”

# *Interrelated competition for rewards at many levels within the same organisation*



HANKEN

\*not an exhaustive list



Secure funding  
Get competitive applicants  
Get or maintain accreditations  
Appear attractive in rankings and comparisons

**How to best provide support for all of this, while facilitating Open Access?**

Conduct research and get it published  
Get positions  
Get grants  
Teach interesting and successful courses  
Supervise  
Have societal impact

*Before submitting your article manuscript to a journal...*



- » **Does your funder or university require anything specific?**
- » **Is there a suitable OA journal available?** If so, great!  
Is there an article processing charge that needs to be paid upon acceptance?
- » **If you submit to a traditional subscription-access journal**, is there a delay with which you can make your manuscript OA through a repository? Or does your library even enable free hybrid OA publishing in the journal?
- » If in doubt, ask your librarian!

# Key takeaways



- » **Open access has had a rough start** due to highly clustered publishing landscape.
- » **Co-ordination is needed to make wide-scale change happen**, funders, universities and national consortia should collaborate to push towards the common goal of open access. But even individual acts by researchers matter!
- » **Open access is increasingly required** by different stakeholders and can be perceived as an additional burden, however, it is for the good of everyone (particularly for you as an author).
- » **Not using research to its full potential is a waste** – why spend months/years on work for an article and then not use 20 more minutes to ensure that it is read as widely as possible and permanently open?

*Thank You!*

*Want to know more about this topic?*



What's the big deal? The economics of global Open Access, Mikael Laakso

Up next

AUTOPLAY



**Open Science MOOC**  
Published on Aug 1, 2019

<https://youtu.be/3rmbeWGgrWE>

# Three recommended reads



HANKEN

## The impact of free access to the scientific literature: a review of recent research

Philip M. Davis, PhD; William H. Walters, PhD, FCLIP

See end of article for authors' affiliations.

DOI: 10.3183/1538-5050.99.3

**Objectives:** The paper reviews recent studies that evaluate the impact of free access (open access) on the behavior of scientists as authors, readers, and citers in developed and developing nations. It also examines the extent to which the biomedical literature is used by the general public.

**Methods:** The paper is a critical review of the literature, with systematic description of key studies.

**Results:** Researchers report that their access to the scientific literature is generally good and improving. For authors, the access status of a journal is not an important consideration when deciding where to publish. There is clear evidence that free access

increases the number of article downloads, although its impact on article citations is not clear. Recent studies indicate that large citation advantages are simply artifacts of the failure to adequately control confounding variables. The effect of free access on general public's use of the primary medical literature has not been thoroughly evaluated.

**Conclusions:** Recent studies provide little evidence support the idea that there is a crisis in access to scholarly literature. Further research is needed to investigate whether free access is making a difference in non-research contexts and to better understand dissemination of scientific literature through peer networks and other informal mechanisms.

### INTRODUCTION

A principal argument in support of open access publishing rests on the belief that the subscription-based publishing model has produced a crisis of accessibility to the scientific literature [1-6]. This paper evaluates that claim, reviewing the current literature and showing the ways in which free access has (or has not) had an impact on scholars, clinicians, and the general public in developed and developing nations.

The review assesses impact in terms of reading, citation, and related forms of use. It does not evaluate the extent to which the freely available scientific literature is technically accessible, indexed, cataloged, or available for potential use. The discussion deals only with the scholarly literature, thereby excluding studies of online newspapers, magazines, and trade publications. It also focuses on the natural sciences, since most of the research on free access has dealt with fields such as the biomedical, physical, and computer sciences. Although "open access" is the usual term for scholarly work that is freely accessible online, the term "free access" is used here, since open access is often understood to include issues of copyright, archiving, funding, and social justice that are not addressed in this discussion.

The paper first reviews the impact of free access on the research practices of scholars in developed and developing nations, then examines the use of freely available biomedical literature by health professionals and the lay public. It concludes with a discussion of avenues for further research.

 Supplemental Tables 1 and 2 are available with the online version of this journal.

208

J Med Libr Assoc 99(3) July 2011

Davis & Walters (2011)



FEATURE ARTICLE

### POINT OF VIEW

## How open science helps researchers succeed

**Abstract** Open access, open data, open source and other open scholarship practices are growing in popularity and necessity. However, widespread adoption of these practices has not yet been achieved. One reason is that 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. These findings are evidence that open research practices bring significant benefits to research relative to more traditional closed practices.

DOI: 10.7554/eLife.16800.001

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### Introduction

Recognition and adoption of open research practices is growing, including new policies that increase public access to the academic literature (open access; Björk *et al.*, 2014; Swan *et al.*, 2015) and encourage sharing of data (open data; Heilmästädt *et al.*, 2016; Michener, 2015; Stodden *et al.*, 2013), and code (open source; Stodden *et al.*, 2012; Shamir *et al.*, 2013). Such policies are often motivated by ethical, moral or utilitarian arguments (Suber, 2012; Willinsky, 2006), such as the right of taxpayers to access literature arising from publicly-funded research (Suber, 2003), or the importance of public software and data deposition for reproducibility (Poline *et al.*, 2012; Stodden, 2011; Ince *et al.*, 2012). Meritorious as such arguments may be, however, they do not address the practical barriers involved in changing researchers' behavior, such as the common perception that open practices could present a risk to career advancement. In the present article, we address such concerns and suggest that the benefits of open practices outweigh the potential costs.

We take a researcher-centric approach in outlining the benefits of open research practices. Researchers can use open practices to their

advantage to gain more citations, media attention, potential collaborators, job opportunities and funding opportunities. We address myths about open research, such as about the rigor of peer review at open journals, risks to funding and career advancement, and forfeiture of author rights. We offer the current pressures on research on research for advice on how to practice open within the existing framework of academic standards and incentives. We discuss them with regard to four areas – publishing, resource management and sharing, an advancement – and conclude with a list of open questions.

### Publishing

Open publications get more citations. There is evidence that publishing open articles with higher citation rates (cock, 2016). For example, Eysenbach *et al.* (2006) found that articles published in the *Proceedings of the National Academy of Sciences* (PNAS) whose open access (OA) option were likely to be cited within 4–10 months after publication than non-OA articles published

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McKiernan et al (2016)

F1000Research 2016, 5:632 Last updated: 26 SEP 2016



REVIEW

**REVISED** The academic, economic and societal impacts of Open Access: an evidence-based review [version 3; referees: 3 approved, 2 approved with reservations]

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### Open Peer Review

Referee Status: 

Invited Referees

### Abstract

Ongoing debates surrounding Open Access to the scholarly literature are multifaceted and complicated by disparate and often polarised viewpoints from engaged stakeholders. At the current stage, Open Access has become such a global issue that it is critical for all involved in scholarly publishing, including policymakers, publishers, research funders, governments, learned societies, librarians, and academic communities, to be well-informed on the history, benefits, and pitfalls of Open Access. In spite of this, there is a general lack of consensus regarding the potential pros and cons of Open Access at multiple levels. This review aims to be a resource for current knowledge on the impacts of Open Access by synthesizing important research in three major areas: academic, economic and societal. While there is clearly much scope for additional research, several key trends are identified, including a broad citation advantage for researchers who publish openly, as well as additional benefits to the non-academic dissemination of their work. The economic impact of Open Access is less well-understood, although it is clear that access to the research literature is key for innovative enterprises, and a range of governmental and non-governmental services. Furthermore, Open Access has the potential to save both publishers and research funders considerable amounts of financial resources, and can provide some economic benefits to traditionally subscription-based journals. The societal impact of Open Access is strong, in particular for advancing citizen science initiatives, and leveling the playing field for researchers in developing countries. Open Access supersedes all potential alternative modes of access to the scholarly literature through enabling unrestricted re-use, and long-term stability independent of financial constraints of traditional publishers that impede knowledge sharing. However, Open Access has the potential to become unsustainable for research communities if high-cost options are allowed to continue to prevail in a widely unregulated scholarly publishing market. Open Access remains only one of the multiple challenges that the scholarly publishing system is currently facing. Yet, it

Tennant et al (2016)

# ...and one more

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# References



HANKEN

- Bohannon, B. (2016). Who's downloading pirated papers? Everyone. *Science.*, 352(6285), 508–512. <http://doi.org/10.1126/science.352.6285.508>
- Costas, R., Zahedi, Z., & Wouters, P. (2014). Do “altmetrics” correlate with citations? Extensive comparison of altmetric indicators with citations from a multidisciplinary perspective. *Journal of the Association for Information Science and Technology*, 66(10), 2003–2019. <http://doi.org/10.1002/asi.23309>
- Crawford, W. (2017). Gold Open Access Journals 2011-2016. <https://waltcrawford.name/goaj2.pdf>
- Davis, P. M., & Walters, W. H. (2011). The impact of free access to the scientific literature: a review of recent research. *Journal of the Medical Library Association: JMLA*, 99(3), 208–217. <http://doi.org/10.3163/1536-5050.99.3.008>
- Laakso, M. (2014) *Measuring Open Access: Studies of Web-Enabled Innovation in Scientific Journal Publishing*; Edita Prima: Helsinki, Finland, 2014. <http://hdl.handle.net/10138/45238>
- McKiernan, E. C., Bourne, P. E., Brown, C. T., Buck, S., & Kenall, A. (2016). How open science helps researchers succeed. *Elife*. <http://doi.org/10.7554/eLife.16800.001>
- Piowar, H., Priem, J., Lariviere, V., Alperin, J. P., Matthias, L., Norlander, B., et al. (2018). The state of OA: a large-scale analysis of the prevalence and impact of Open Access articles. *PeerJ*, 6(4), e4375–23. <http://doi.org/10.7717/peerj.4375>
- Suber, P. (2012). *Open Access*. MIT Press. <https://mitpress.mit.edu/books/open-access>
- Teplitskiy, M., Lu, G., & Duede, E. (2016). Amplifying the impact of open access: Wikipedia and the diffusion of science. *Journal of the Association for Information Science and Technology*. <http://doi.org/10.1002/asi.23687>
- Tennant, J. P., Waldner, F., Jacques, D. C., Masuzzo, P., Collister, L. B., & Hartgerink, C. H. J. (2016). The academic, economic and societal impacts of Open Access: an evidence-based review. *F1000Research*, 5, 632–54. <http://doi.org/10.12688/f1000research.8460.1>
- Wang, X., Liu, C., Mao, W., & Fang, Z. (2015). The open access advantage considering citation, article usage and social media attention. *Scientometrics*, 103(2), 555–564. <http://doi.org/10.1007/s11192-015-1547-0>
- Zuccalá, A. (2009). The lay person and Open Access. *Annual Review of Information Science and Technology*, 43(1), 1–62. <http://doi.org/10.1002/aris.2009.1440430115>

# Q & A



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