Doing research tomorrow like we do today?
What open science can bring

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Eurodoc = early-career researchers

- non-profit organisation
- based in Brussels (2002)
- 28 grassroots national associations
- supported by volunteers
- develop & inform policy
- run workgroups & events

cc-by G.O’Neill and O.Berezko

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Why talk about Open Science?

Open science is the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society. [https://www.fosteropenscience.eu/foster-taxonomy/open-science](https://www.fosteropenscience.eu/foster-taxonomy/open-science)

’open communication of the results, hypotheses and opinions - as suggested by the phrase “academic freedom” - lies at the very heart of the scientific process.’ UNESCO Recommendation on Science and Scientific Researchers (2017) [https://unesdoc.unesco.org/ark:/48223/pf0000367018](https://unesdoc.unesco.org/ark:/48223/pf0000367018)

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Open science concerns every aspect of the research workflow.
Why Open Science?

“The conduct of science in such a way that others can collaborate and contribute, where research data, laboratory notes and other research processes are freely available, with licence terms that allow re-use, redistribution and reproduction of the research.”

(https://www.fosteropenscience.eu/content/open-science-scientific-research)

OS can also be an effective tool for research managers to transfer knowledge to society, and optimize the use and re-use by unforeseen collaborators.

https://www.fosteropenscience.eu/content/impact-open-science
Why Open Science?

- increases discoverability
- increases (social) impact
- facilitates reproducibility
- shares & saves resources
- speeds & helps innovation

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Let’s zoom on open/FAIR data

« As open as possible, as closed as necessary »

cc-by SangyaPundir for Wikipedia

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Let’s zoom on open/fair data

« As open as possible, as closed as necessary »

Findable
- Metadata searchable by human and machines
  - Persistent identifier

Accessible
- Retrievable through standard protocols
  - Open when allowed

Interoperable
- Metadata use standardized terms
  - Field-specific controlled vocabulary

Reusable
- Terms of use are clarified
  - Use a CC-licence

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Let’s zoom on open/fair data

« As open as possible, as closed as necessary »

EU could save €10.2 billion per year by using FAIR data
https://ec.europa.eu/research/openscience/index.cfm

Sharing data can increase the citation rate of scientific papers
by as much as 69%
https://www.fosteropenscience.eu/content/impact-open-science
based on Piwowar, Day and Frisma, 2007
(https://doi.org/10.1371/journal.pone.0000308)

Example of EU-supported projects on FAIR data:

DARIAH-EU

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The European Council of Doctoral Candidates and Junior Researchers
the EOSC as central mechanism for FAIR data


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FAIR data : the added value of a DMP

A Data Management Plan is likely to become mandatory for all publicly funded research project in the future

https://www.openaire.eu/what-is-a-data-management-plan

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Let’s zoom on open access

From a paywalled publication system to an open publication system

Subscription for readers → Pay to read

Fees for authors/the institutions hosting the authors → Pay to publish

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Open access increases impact


https://www.yearofopen.org/what-is-open-access/ (material from the Aston University)

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The paywalled publishing system

Submit publicly funded work
Peer review articles
Pay for extra services (colours), etc

Scientists

Publishers

Scientist

Paywalls lifted through agreements between publishers and libraries

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The paywalled publishing system

Scientists

Submit publicly funded work
Peer review articles
Free work

Paywalls lifted through agreements between publishers and libraries

Scientist

Profitability margin: 36%
Pay for extra services (colours), etc

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Subscription costs are high

The overall expenditure on subscriptions paid to all publishers in the 26 surveyed countries is €597 million. Of this amount, €451 million are spent on subscriptions to Elsevier, Springer Nature, Wiley, Taylor & Francis and ACS - roughly equivalent to 75% of the total volume (L. Stoy, R. Mrorais, L. Borrel-Damian, Decrypting the Big Deal Landscape, EUA, 2019)
Subscription costs are not evenly distributed

L. Stoy, R. Mrorais, L. Borrel-Damian, EUA, 2019

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The paywall system is expensive and unfair

Under paywall, research results are:
- Sold by private operators
- Inaccessible to most

https://paywallthemovie.com/
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Plan S (Coalition S) supports open access

Paywalled Journals

Subscription agreements

Open access journals

Transformative agreements

APC based models

+ national funders

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The revised version of Plan S

A structural answer to the inflation of APCs

• Transparency of costs/prices
• Revision of the evaluation processes of researchers
• Inclusion of new publication models

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New publication models as alternative or complement to journals

Community run journals, community run or privately run platforms

Transparency of cost structure/non-profit based

Tools for open review/open comments, collective cooperation on publications (and sometimes data) → more than just publications

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# Open Access options under Plan S

<table>
<thead>
<tr>
<th>Green open access</th>
<th>Gold open access</th>
<th>Diamond open access</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Publish in a non-open access journal</td>
<td>- Publish in a APC based journal/platform</td>
<td>- Publish for free in a journal or a platform</td>
</tr>
<tr>
<td>- Deposit without embargo a pre-print or post-print version in a repository (see OpenDOAR)</td>
<td>- Pay the APC or under benefit from a transformative agreement</td>
<td>- Free actually means that the costs are supported by the community</td>
</tr>
</tbody>
</table>

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Decisive incentives for open science

Research design → Data collection → Data analysis → Intermediary research reports → Scientific articles → Vulgarisation

Permanent identifiers
Open Licences

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Decisive policy levers for open science

Let’s change what we value in research.

Diana Hicks, Paul Wouters, Ludo Waltman, Sarah de Rijcke & Ismael Rafols, Nature 22 April 2015

An association of metrics and qualitative assessment for research evaluation

https://sfdora.org/read/

http://www.leidenmanifesto.org/

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Decisive policy levers for open science

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Decisive policy levers for open science

The European Council of Doctoral Candidates and Junior Researchers

24
Decisive policy levers for open science

On what could (should) researchers be evaluated:

- The design of innovative research methodology (including citizen science, interdisciplinary initiatives)
- The production and diffusion of datasets/codes
- The redaction of peer reviews
- The production of peer-reviewed working papers, scientific and monographs
- The contribution to pedagogical/vulgarisation initiatives

What is necessary for that:

- Persistent identifiers for every production
- The use/development of alternative metrics
- The combination of metrics and qualitative assessment
Decisive policy levers for open science

<table>
<thead>
<tr>
<th>Measure</th>
<th>Based on</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional metrics</td>
<td>Research output Number of publications and number of citations, based on bibliometric databases, e.g. Web of Science, Scopus, Google Scholar</td>
<td>Journal Impact Factor (JIF), h-index, field normalised citation index, Eigenfactor, SCImago Journal Rank (SJR), Source Normalized Impact per Paper (SNIP), CiteScore, etc.</td>
</tr>
<tr>
<td></td>
<td>Collaborations Co-authorship</td>
<td>Leiden Ranking, etc.</td>
</tr>
<tr>
<td>Usage-based metrics</td>
<td>Usage, i.e. uptake and attention Number of views or downloads of an item</td>
<td>Usage Impact Factor (UIF), Libcitations, etc.</td>
</tr>
<tr>
<td>Alternative metrics</td>
<td>Social outreach Social media (Twitter, blogs, etc.) and scientific social networks (ResearchGate, Mendeley, etc.)</td>
<td>Altmetric.com, PLUMx, ImpactStory, Bookmetrix, Datacite, etc.</td>
</tr>
<tr>
<td>Next-generation metrics</td>
<td>Yet to be developed “open metrics” going beyond alternative metrics</td>
<td></td>
</tr>
</tbody>
</table>


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Decisive policy levers for open science

https://modalyst.co/blog/2015/06/30/why-supply-chain-collaborative-practice-is-paramount-for-success/

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What can you do?

- Train yourself
- Join open communities
- Discuss the topic - Become an open science ambassador 😊

http://eurodoc.net/ambassadors

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Thank you!