EU Open Science policies

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Czech Open Science Day

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Why do we need Open Science?

Open science: sharing knowledge, data and tools as early as possible in the research process in open collaboration with all relevant knowledge actors

- Open science has the potential to increase:
  - **Quality & efficiency of R&I**, if all the produced results are shared, made reusable, and if their reproducibility is improved
  - **Creativity**, through collective intelligence and cross-disciplinary research that does not require laborious data wrangling
  - **Trust** in the science system, by engaging both researchers & citizens

Main challenges and priorities for Open Science

Improve the practice of research and innovation

- Openly accessible scholarly publications
- Early sharing of all research outputs
- All data FAIR, RDM
- Reproducible results
- Societal engagement and responsibility

Develop proper enablers

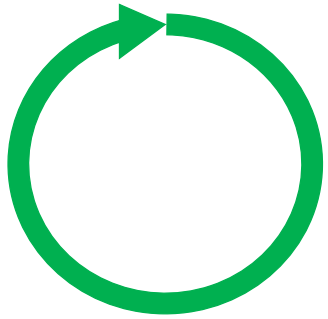
- Rewards and incentives to adopt Open Science practices, with appropriate metrics
- Appropriate skills and education, including for research integrity
- Open Research Infrastructures including the European Open Science Cloud (EOSC)

Reproducibility: The ‘crisis’ (zoom in *health R&I)*

- Close to €300 billion/year for Health R&I (worldwide)
- A large share of the research investment may be wasted: potentially as much as 85%, according to Chalmers & Glasziou 2009, Lancet; Macleod 2014, Lancet

Unusable research reports
- Methods and codes unavailable; Inadequate information on medical interventions in trials; etc.

Scientific question not pertinent
- Not relevant to clinicians, carers and patients; Lack of awareness of already existing evidences; etc.



Biased reporting of results *- Selective reporting; Data reported not made comparable with other studies; Conflicts of interest; Fraud; etc.*

Poor study design, conduct and analysis *- Low statistical power; Not replicated enough; Not enough collaborative efforts; Poor training and mentoring of researchers; etc.*

Results not fully accessible
- “Disappointing” results less likely to be promptly published (or at all); Trials not registered; etc.

Open Science: a crucial part of ERA

European Commission

ERA Communication: A New ERA for R&I

Communication on a new European Research Area for Research and Innovation (September 2020)

Deepening the ERA

The Commission will: (Action 9)

- Launch, via the Horizon Europe Programme, a **platform of peer-reviewed open access publishing**;
- **analyse authors' rights** to enable sharing of publicly funded peer-reviewed articles without restriction;
- ensure a **European Open Science Cloud** that is offering findable, accessible, interoperable and reusable research data and services (Web of FAIR); and
- incentivise open science practices by improving the **research assessment system**.

Citizen Engagement

The Commission will: (Action 13)

- Organise with Member States and stakeholders Europe-wide **citizen science campaigns** to raise awareness and networking, crowdsourcing platforms and pan-European hackathons, in particular in the context of Horizon Europe Missions. The Commission will develop with Member States best practices to open up science and innovation to citizens and youth.

European Commission

Towards a new *modus operandi* for Science

Current System (dominant)		Open Science	
Excellence defined largely on the basis of *where* scientists publish		Composite definition of excellence	
Incentivises researchers to produce specific outputs (*mainly publications*) and to publish as much and as fast as possible (*publish or perish!)*	Use of quantitative metrics	Incentivises researchers to share knowledge/data early and openly, to collaborate, and to increase quality and impact; While considering diversity of outputs and research cultures	Use of qualitative and quantitative metrics
Rewarding individual competing scientists - gaining scientific prestige		Rewarding team work, collaboration and sharing to achieve societal impact (e.g. Covid-19)	

Changing the research assessment system

- The Commission **is currently consulting** research funders, research performers, policy makers, and other stakeholders, **on how to advance with reforming the research assessment system**.
- A proposed way forward is to **reach an agreement by 2022** (such as an MoU) **between those willing to reform the current research assessment system**, which would be signed by an increasing number of funders and research performing organisations.
  - Agreement setting ambitions, specifying broad lines of action, and committing signatories to act;
  - For a more qualitative assessment of research, researchers and institutions, that considers the value and impact of a diversity of outputs and research cultures, and that incentivizes open collaboration and knowledge and data sharing.

Copyright and open science

- **Adequate copyright management** is (and has always been) at the core of open science
- **Copyright** is a bundle of rights that:
  - ✓ protect authors on their creations (protection)
  - ✓ allows copyright holders to determine who, when and how will access and reuse works (dissemination)

Although traditionally associated with "protection", copyright also sets the conditions for "dissemination".

By assigning their copyright to publishers (e.g.via a publishing agreement), researchers are giving them the right to determine the conditions for dissemination (even when research has been publicly funded).

- **Under the ERA** (Action n.9) the Commission will "analyse authors' rights to enable sharing of publicly funded peer-reviewed articles without restriction"

Open Research Europe

The open access publishing platform of the European Commission

Why Open Research Europe?

- **Support our open access policy** and beneficiary capacity to adhere to it and also enables **publishing post-grant**
- Leading by example in operationalising **open science principles** within scientific publishing and **enabling the European Research Area**
- Contribute to **transparency** and **cost-effectiveness** and explore **sustainable** open access publishing business models

European Commission

EOSC

EUROPEAN OPEN SCIENCE CLOUD

- Trusted, **federated** and multi-provider **ecosystem** that cuts across borders and scientific disciplines.
- Brings together institutional, national and European stakeholders, initiatives and infrastructures.
- Vision: a “**Web of FAIR Data and Services for Science**”.
- It will enhance the possibilities for researchers to find, share and reuse research outputs like **publications, data, and software** leading to **new insights** and innovations, higher research **productivity** and improved **reproducibility** in science.

The challenge is not limited to linking datasets, federating infrastructures or aligning policies. It starts by linking people and organisations across the EOSC ecosystem.

Open Science in Horizon Europe

European Commission

Open Science in Horizon Europe

Evolution of OS policies across FPs

2008

FP7

OA **Pilot**

Deposit and open access

2014

H2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **Pilot**

2017

H2020

OA **Mandatory**

Deposit and open access

& ORD/DMP **by default (exceptions)**

Under **Horizon Europe (2021)**

- Open Science (OA, RDM, Citizen Engagement, etc.) embedded across the FP
  - **Evaluation** of proposals (excellence –methodology-, quality & efficiency of implementation)
  - **Grant Agreement, guidelines**
  - **Reporting**—during the project's lifetime
  - **Work programmes**
- Strengthening of the obligations with respect to open access and focus on responsible RDM in line with FAIR

Open access to peer-reviewed publications

- Obligation to ensure **deposition** at the time of publication in a **trusted repository** and **immediate** open access through repository
- Beneficiaries/authors must **retain sufficient IPR** (to comply with OA requirements) and ensure OA under open licenses [CC BY (or equivalent) for journal articles, CC BY NC/ND (or equivalent) allowed for long-text formats]
- Beneficiaries publish in venues of their choosing. Any publication fees (APCs/BPCs) only **refundable** if publishing venue is **full open access** (costs non-eligible if publishing venue is hybrid)
- **Metadata** of deposited publications/research data open (the latter with exceptions) under CC0 or equivalent in line with FAIR principles

Responsible research data management, in line with FAIR

- At proposal stage, beneficiaries will be evaluated on **preliminary** research data and research output management **considerations**
- All projects that generate (and/or re-use) research data will have to establish and regularly update a **Data Management Plan** (living document)
- Beneficiaries will have to deposit data in a **trusted repository** and link data to publications they underpin, if applicable
    - For some actions, additional obligation that the data repository is federated under EOSC.
- Ensure open access "**as open as possible, as closed as necessary**", ASAP within the deadline (set up in the DMP) under CC BY or CC0 (or equivalent), unless exceptions (justified in the DMP)

Additional obligations regarding Open Science practices

- Where the call conditions impose additional obligations regarding the **validation** of scientific publications
    - The beneficiaries must provide (digital or physical) **access** to data or other results needed for validation of the conclusions of scientific publications, to the extent that their legitimate interests or constraints are safeguarded
- Where the call conditions impose additional obligations in case of a **public emergency**
    - The beneficiaries must (if requested) immediately deposit any research output in a repository and provide OA to it under CC BY, CC 0 or equivalent
        - As an exception, if the access would be against the beneficiaries' legitimate interests, they must grant nonexclusive licenses – under fair and reasonable conditions, to legal entities that need the research output to address the public emergency, and commit to rapidly and broadly exploit the resulting products and services at fair and reasonable conditions.

Evaluation of proposals and Open Science

“Excellence” criterion

(methodology)

- Evaluation of the quality of open science practices
- Up to 1 page to describe OS practices + up to 1 page to describe research data/output management

“Quality and efficiency of implementation” criterion

(capacity of participants and consortium as a whole + list of achievements)

- Explain expertise on OS
- List publications, software, data, etc, relevant to the project with qualitative assessment and, where available, persistent identifiers

Publications are expected to be open access; datasets are expected to be FAIR and ‘as open as possible, as closed as necessary‘. **Significance of publications to be evaluated on the basis of proposers’ qualitative assessment** and not per Journal Impact Factor

Thank you

European Commission