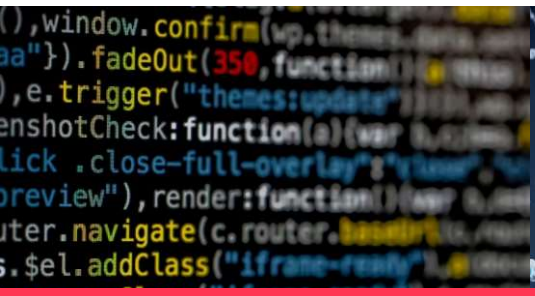

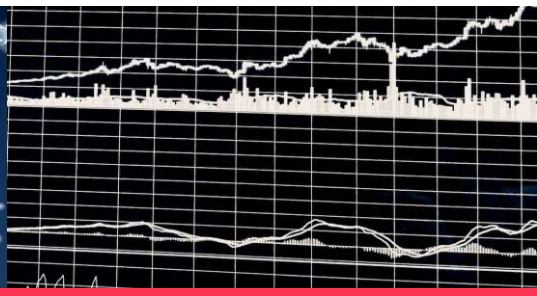

ROSiE

Policy brief No.2

Responsible Open Science in Europe

Highlights

1. Open Science policies at national level are at very **different stages of development**.
2. Most public policies are **short and not very detailed**, regarding discipline-related particularities of Open Science.
3. The extent to which data can be accessed **still differs among countries**, even within the European Union.
4. **Capacity building** is a precondition to implement Open Science in line with Research Ethics and Research Integrity.
5. Issues of misinterpretation of data protection by researchers can be successfully addresssed **by proper training in Open Science**.
6. The benefits of OS, through data sharing and reuse, **may be put at risk from a lack of full understanding of GDPR**.

Who is it for?

Policymakers at the EU level: European Commission, European Parliament, European Council, Council of the European Union, European Data Protection Board; policymakers at national, institutional, and funder levels.

Introduction

According to UNESCO's Recommendation, Open Science (OS) is defined as "*an inclusive construct that combines various movements and practices aiming to make multilingual scientific knowledge openly available, accessible and reusable for everyone*".

OS is among the most discussed topics in current research and innovation (R&I) policy and is widely supported in Europe. The opening of scientific processes, from planning and designing to executing to sharing and valorizing, provides a new context for this vision, with many opportunities and challenges related to Research Integrity (RI) and Research Ethics (RE).

While RI and RE can profit from OS, e.g. data reuse, increased reproducibility, new and better research results, and increased accessibility of R&I to all interested stakeholders, new challenges for RI and RE also arise, requiring timely attention and management.

ROSiE project, through a comprehensive inventory of RI and RE challenges, identified existing gaps at the policy level and highlighted the need for complex systemic changes, which involve infrastructural solutions, cultural and behavioral adjustments, and policy interventions.

This 2nd ROSiE policy brief displays the main elements of "The ROSiE general guidelines in Responsible OS"

This project has received funding from the European Union's Horizon 2020 research and innovation programme under GA No 101006430

Research environment & infrastructure

- Policymakers, Research Funding Organizations (RFOs), and Research Performing Organizations (RPOs) should involve all relevant stakeholders in formulating OS guidelines and developing support materials and infrastructures.
- Policymakers and RFOs should provide incentives to RPOs for the promotion and practice of OS.
- RPOs should provide researchers with the necessary resources and infrastructure to support, promote, and incentivize responsible OS practices, regardless of their location or institutional affiliation.
- Policymakers and RPOs should provide adequate research support structures and services, such as services for data stewardship, that would help researchers translate OS-supportive principles into practice.
- When considering technologies in OS infrastructures, such as artificial intelligence (AI) and blockchain, it is important to continuously explore their usefulness, limitations, and risks to ensure they safeguard ethics and integrity appropriately.

Protection of research participants, the Environment, Ecosystems, and Cultural Heritage

- In an OS environment, informed consent forms and procedures should include at a minimum, information on OS practices, privacy protection, limitations, and risks of reidentification.
- Policymakers should analyse the risks of reidentification and dual use in different fields and develop governance mechanisms and technical solutions to address these risks. Exploring other approaches to protect privacy, other than anonymization, is increasingly becoming important and is thus recommended.
- The principle of openness according to the nuances of different research fields and methods should be explored. Special consideration should be placed on cultural data and the necessity of restrictive access in some instances.

Open and reproducible research practices

- Researchers and RPOs should ensure open access to the entire research lifecycle.
- Contracts with RFOs and other entities should include equitable agreements about access to and dissemination of research results.
- RPOs and repositories should ensure appropriate infrastructures to allow the proper conservation and management of all research results generated in the research lifecycle, including those unpublished, ensuring their protection and adequate access to them for a reasonable time.
- Researchers and RPOs should ensure that the research lifecycle, including interim evaluation results, are documented in a detailed, accurate, and clear manner in accordance with the guidelines specific to the subject of study.

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Research evaluation

- Adoption of research assessment and funding schemes that enable and reward researchers who act in accordance with good OS practices.
- Research performance assessment systems should prioritise quality and openness of the research results over the quantity of published papers.
- Evaluation systems should support peer-review processes that are open and transparent.
- The research community should acknowledge the merit of data collection in the context of research evaluation.

Citizen science

- Policymakers, RFOs, RPOs, and researchers are responsible for promoting and supporting citizen science, by ensuring support throughout the research lifecycle, through the provision of adequate funding, training, flexible grant structures that accommodate extended timeline research, and encouraging collaborations and building synergies between researchers and other stakeholders.
- Researchers working with citizen scientists should ensure transparency and open communication to diminish unavoidable power imbalances.
- Policymakers, in collaboration with the scientific community, should develop targeted strategies on how to involve diverse societal actors in citizen science to avoid situations where inequalities existing in society are replicated in activities of public engagement.

Training & education

- Policymakers and RPOs should ensure that training and education in responsible OS focuses on the entire research lifecycle and start early-on.
- RPO activities that increase the number of OS trainers should be implemented at different organisational levels.
- OS training should be tailored to the needs and specificities of diverse scientific disciplines addressing discipline-specific legal, ethics, and integrity challenges.
- OS training should also consider the potential effects of informal education and create awareness for the benefit of OS practiced responsibly by supervisors and mentors.

Inclusivity

- Policymakers, RFOs, RPOs, and researchers from high-income countries should provide support to institutions from low and middle-income countries (LMICs) in building their capacities, exchanging good practices, and establishing infrastructure conducive to OS.
- RFOs and publishers need to consider unequal opportunities that researchers from LMICs have in accessing and contributing to OS and take measures to promote inclusivity, such as expanding OA publication privileges to more countries.
- The rights and participation of marginalized groups and individuals with vulnerabilities, including individuals with disabilities, the elderly, individuals from LMICs, indigenous populations, among others, should be ensured in an OS environment.

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Policy brief No.2

OS & Academic Freedom

As stated in the study of the Panel for the Future of Science and Technology, entitled "State of play of academic freedom in the EU Member States" (PE 740.231 – March 2023) "ever since the early history of European Universities, academic freedom has been acknowledged to be a fundamental feature of any higher education research system or institution. More recently, academic freedom has been recognised as a basic condition for a healthy democracy and an essential feature of any democratic political order."

Academic freedom applies to members of the academic profession, but also to university students and administrative staff members. This reflects the recognised dimensions of Academic Freedom that, according to the aforementioned study, include: (a) freedom to research, (b) freedom to teach and learn, and (c) academic freedom of expression.

Among the factors underlying the erosion of Academic Freedom in the EU Member States, the most pertinent to the research enterprise, at large, is "the transformation of society, including the growing socio-economic importance of knowledge and its link to innovation."

OS consists of a set of practices that permeate the processes and practices within the entire research lifecycle, effectively redefining and enriching how we teach, learn, and research. It opens academic processes to a deeper inclusion of society. Research practices and results that were previously circulating within a confined community of stakeholders are now starting to reach a larger audience. Indeed, OS is the new and more robust standard of what it is to do science.

If traditional science posed risks to academic freedom, the same may be said about OS. This threat, however, springs internally, i.e., from the inherent contradictory character of important breakthroughs. ROSiE, by putting the term "responsible" in front of OS, succeeded in making a small step towards providing the tools that promote the positive impacts of OS, and in doing so, for Academic Freedom as well. A concise exposition of these tools is made in this policy brief.of these tools is made in this policy brief.

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