D8.6.: Policy Brief

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Project title: Responsible Open Science in Europe
Project Acronym: ROSiE
Grant Agreement no.: 101006430
Lead contractor for this deliverable: NTUA

Deliverable factsheet:

Project Number:	101006430
Project Acronym:	ROSiE
Project Title:	Responsible Open Science in Europe
Title of Deliverable:	Policy Brief
Work Package:	WP 8
Due date according to contract:	M18-August 2022
Editor(s):	Costas A. Charitidis
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ABSTRACT:	This document contains a concise summary of the outcomes of the of ROSiE project and recommendations on the best policy option for responsible Open Science. It is aimed at institutional and government policymakers, and others interested in formulating or influencing policy.
Keyword List:	Open Science, Citizen Science, Responsible Research and Innovation, Challenges, Policy gaps, Research Integrity, Policymaking, Recommendations

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

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Revision history:

VERSION	DATE	Revised by	Reason
0.1	16/01/23	Vana Stavridi	Reviewers request in project review report
0.2	18/01/23	Eleni Spyrakou	Comments on the 1st draft
0.3	18/01/23	Vana Stavridi, Panagiotis Kavouras	Preparation of the 2nd draft
0.4.	24/01/23	Tom Lindemann, Lisa Tamborlino, Vivian Nchanchou Mbanya, Olivier Le Gall	Comments on the 2nd draft
0.5	27/01/23	Vana Stavridi, Panagiotis Kavouras	Preparation of the prefinal version
1.0	31/01/23	Rose Bernabe	Final version

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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.

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Recommendations

Align action at the European, National and Institutional level.

- The majority of EU countries already have public policies and/or strategies at the national level but they are at a **very different stages of development of OS.** This confirms the policy and regulatory heterogeneity among countries.
- The heterogeneity among national policies can create **challenges in research collaborations**, particularly in **multi-national** research projects.
- **A policy environment conducive to responsible open science** should take into account this heterogeneity in the ongoing harmonization and standardization of processes.

Develop policies that will take into account discipline-related particularities.

- Most **public policies are not very detailed** regarding identified discipline-related and practice-related particularities.
- OS policy and guidance, due to the terminology and concepts used, **often risk to inadvertently exclude** the arts and humanities where, for instance, the practical meaning of concepts such as reproducibility is not immediately obvious.
- **Sensitivity to disciplinary differences** is crucial to accomplish a full and genuine transition to open science.

Develop an action plan on how to design and curate cost-effective OS infrastructures and tools in a sustainable and fair way, taking into consideration different levels of readiness in the EU members and associated countries.

- **Open Access (OA) infrastructures represent a pillar of responsible OS**. The support of this practice in national OS/OA policies should therefore be encouraged.
- Policy recommendations for use of open data repositories, in the case of countries that lack national repositories, should explicitly guide researchers to use existing European infrastructures, in order to avoid **potential sources of confusion and inefficient adaptation of OS by researchers**.

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Recommendations

Coordinate actions on EU level on providing training and support for researchers engaging with OS

- **Capacity building is a precondition** to implement OS in line with standards developed for RI and RE.
- **The Integration of OS education into curricula** from, at least, the undergraduate level increases the number of researchers competent to implement OS practices.
- **Train-the-trainer initiatives on OS** will increase the number of skilled trainers who can teach OS practices responsibly.
- Training materials could cover **a broad range of topics**, like conflict of interests in OS and citizen science; authorship, group authorship and contributorship in citizen science; data sharing and reanalysis; predatory publishing practices; open peer review; using social media data in the context of OS.
- Appropriate training will also help to ensure that fast-pace developments in the area of OS are taken into account **and appropriately reflected in codes of conduct for RI**.

Blockchain technologies could mitigate RE and RI issues in OS, especially data protection.

- **Blockchain technology (BCT) could play a significant role** to facilitate data **FAIRification and authentification**, promotes **data integrity and confidentiality**, while it **prevents misuse of data**.
- However, **the policy ecosystem is not fully adapted to BCT**, as a result rules and regulations have to be retrofitted.

Plain-language guidance is needed for researchers to be able to open their data in a GDPR-compliant manner.

- The benefits of OS **may be put at risk from a lack of full understanding of GDPR**. There is a need to convey the content of GDPR, for instance application of robust informed consent processes, in an understandable way to non-legal experts.
- Many researchers **tend to overemphasize data protection** whenever there is a knowledge gap. That usually prevents the opening of their research data.

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Summary

- The **challenges** arising from the transition to OS are **multiple, multifactorial** and, in some cases, **unprecedented**.
- A number of existing guidelines and declarations can be foundational for Responsible OS and guide national public policies for OS. In Europe there is the ALLEA **European Code of Conduct for Research Integrity (ECoC)** that covers a broad range of issues.
- The existing guidelines and declaration are limited by the aspects of RE/RI in OS they cover. **Policy makers are expected to develop adequate policy frameworks and guidelines for responsible implementation of OS at different levels:** institutional, national, EU, international.

What ROSiE brings

ROSiE project aims to support policy development and implementation of Open Science through specific outputs:

- **A strategic policy paper** for promoting responsible OS
- **Operational guidelines** for relevant stakeholders
- **A supplement to the ECoC** for OS
- **Guidance on existing technologies and platforms** for responsible OS
- **Training materials** for students, early and experienced researchers, citizen scientists and other OS practitioners, for acquiring skills required for practicing Responsible OS
- **A Knowledge Hub** that aims to provide recommendations on how to apply OS to OS platforms and end users.

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