Policy trends in open science

Following the 2007 OECD principles and guidelines [1] on access to public research data, OECD countries have made efforts to adapt legal frameworks and implement policy initiatives to encourage greater openness in science (OECD, 2015). At the level of research institutions, implementing measures and policies may take the form of mandatory rules on access to scientific publications or data, incentives for open access publishing, or funding for infrastructure. The measures are thus of three kinds: sticks (mandatory rules), carrots (incentives), and enablers (soft and hard infrastructure).

- *Mandatory rules* are often implemented in the form of requirements in research grant agreements, or in some cases are defined in national strategies or institutional policy frameworks.
- *Incentive mechanisms* may take the form of financial support to cover open access publishing costs or the release of data sets. They may also be in the form of proper acknowledgment of open science efforts of researchers and academics, for instance data set citations or career advancement mechanisms partly based on metrics that take into account open science or data-sharing efforts.
- *Enablers* include for example infrastructure developed to share articles or data; initiatives undertaken to develop an open science culture; amendments to the legal framework to make them increasingly open science-friendly; or development of the skills necessary for researchers to share and reuse the research outputs produced by others. Data management guidelines for universities and public research institutes also can constitute an enabling condition.

Measures belonging to the three types of actions may be implemented together to promote open access, by means of integrated and multi-faceted approaches. Recent policy trends, however, have revealed that the majority of initiatives implemented so far involve mandatory rules for open science and development of the infrastructure to enable open science.

As regards incentives, research funding agencies and governments often provide funding to cover the costs of open access publishing. In contrast, reward mechanisms for researchers involved in open access and open data activities are less common. Reward mechanisms that are currently under discussion include widespread use of data set citation and/or proper acknowledgment of open science and data-sharing efforts in career advancement mechanisms, or grant attribution to research teams.

Legal frameworks that explicitly accommodate open science (i.e., that are open science-friendly) are an additional means of promoting open science. For example, in Germany [2] the national copyright act was modified in 2013 to allow publicly funded scientists and researchers to retain the legal right to upload their publications on line, even if they have transferred their exploitation rights to the publishers, after an embargo period of up to 12 months. The United Kingdom [3] has recently passed a series of amendments to its legal framework for copyright (that came into force in 2014); these include greater freedom of reuse of copied or recorded material for education and non-commercial research purposes. Australia and Finland [4] are also considering modifications of the existing legal framework around the publication of publicly funded research results, to make the copyright legislation increasingly open science-friendly.

Ultimately however, the key to making open science a reality will be to ensure that the social contract between scientists is strengthened and not weakened. Governments and public research institutions must ensure that open science policies, especially when it comes to open data, allow scientists to continue to compete and be recognised for their contributions if they are to be incentivised to share access to scientific data and results

For further reading

OECD (2007), OECD Principles and Guidelines for Access to Research Data from Public Funding, http://www.oecd.org/sti/sci-tech/38500813.pdf [1]

OECD (2015), Making Open Science a Reality, OECD report, LINK

Links
[1] http://www.oecd.org/sti/sci-tech/38500813.pdf
[2] https://www.innovationpolicyplatform.org/topic-menu/germany
[3] https://www.innovationpolicyplatform.org/topic-menu/united-kingdom
[4] https://www.innovationpolicyplatform.org/topic-menu/finland