PASTEUR4OA Briefing Paper: Open Access to Research Data

Authors: Marieke Guy and Lieke Ploeger (OKF)

Reviewers: Eloy Rodrigues (UMinho), Victoria Tsoukala (EKT) and Mafalda Picarra (Jisc)

November 2015

Open Access to research data is fast becoming recognised as complementary to Open Access to research publications, both key components of Open Science[1].

This briefing paper provides an overview of the current situation with regards to Open Access to research data. It considers the benefits and challenges of opening up research data with a particular focus on current funder and institutional policy developments in Europe and further afield. The PASTEUR4OA project targets the development and reinforcement of Open Access strategies and policies for research publications, while encouraging the development of such policies for research data as well. In these related areas there are many complementary approaches that can be taken. This paper explores both areas and shares resources and initiatives for further study.

General Introduction

The European Commission's 2012 Recommendation on Access to and Preservation of Scientific Information states that '*open access policies aim to provide readers with access to peer-reviewed scientific publications and research data free of charge […] and enable the use and re-use of scientific research results*'. More specifically, '*open access to scientific research data enhances data quality, reduces the need for duplication of research, speeds up scientific progress and helps to combat scientific fraud*'[2].

Open Access to research data is fast becoming recognised by stakeholders, including researchers, research funders, data managers, research institutions, and publishers, as a key complementary activity to Open Access to scientific publications. Both activities hold many benefits for interested parties but also pose significant challenges. Despite these complexities there is a willingness, driven by many converging and diverging agendas, to progress change in this area.

Open Access to Research Data: A Definition

Research data includes the data, files, and other records, produced as part of scientific research that provide evidence about and validate the research findings.

The European Commission defines research data specifically as units of information: facts or numbers used as the basis for reasoning and calculation[3]. The OECD adds that research data

---

1 Open Science: https://en.wikipedia.org/wiki/Open_science

2 Recommendation on Access to and Preservation of Scientific Information: https://ec.europa.eu/research/science-society/document_library/pdf_06/recommendation-access-and-preservation-scientific-information_en.pdf

3 Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020:

is commonly accepted in the scientific community as necessary to validate research findings[4]. The University of Bristol goes one step further to see research data as being arranged in a way that supports "*communication, interpretation, and processing, perhaps by a computer*"[5]. Reseach data may generally be quantitative data, such as numeric facts and statistics, but can also take the form of qualitative data such as interview transcripts, or digital content including images and video, and it tends to be discipline specific. Software and workflows are also increasingly being considered alongside data, especially when the data is not particularly meaningful without the software code that was used to produce or process it[6]. The uniting factor is that research data is not the published research output[7]. Research data is the raw material that leads to research insights and as such it ultimately contributes to our combined stock of knowledge. It is not only an incredibly important resource but essential for academic progress.

Sharing scientific results, or other forms of research, is not a new idea. The great Isaac Newton said of his own research methods: "*If I have seen further it is by standing on ye sholders of Giants*", a quote built on an expression from the 12th century. Researchers in the 20th century began to consider the ideas of open access and in the early 21st century reports were published such as the those by the Royal Society on keeping Science Open[8] and declarations such as that by the OECD Ministers of Science and Technology on Access to Research Data from Public Funding[9] have pushed forward the data sharing mission. More recently the goals of Open Access to Research Data have become further aligned with those of the broader Open Access, Open Data and Open Science movements[10]. The trend is becoming one of 'open by default' when the public purse or public interest is involved.

Open Access to Research Data: Drivers

For anyone working on a research project, managing the data produced is an essential part of research practice that bolsters research integrity. Good research data management makes for good data, good researchers and good research[11]. While the requirement to keep data organised is often self-evident the suggestion that researchers open up this data for others to see and use requires further explanation.

In the Data Harvest report[12] John Wood, Co-Chair of the global Research Data Alliance

http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf

4 OECD Principles and Guidelines for Access to Research Data from Public Funding: http://www.oecd.org/sti/sci-tech/38500813.pdf

5 Bristol University Research Data Management Glossary: http://vocab.bris.ac.uk/data/glossary/

6 Researchobject.org: http://www.researchobject.org - aims to map the landscape of initiatives and activity in the development of Research Objects, an emerging approach to the publication, and exchange of scholarly information on the Web

7 By published research output universities imply journal articles, conference contributions, chapters, books, reports, theses, software, etc. A comprehensive list of research outputs is given on the University of Auckland website: https://www.auckland.ac.nz/en/about/the-university/how-university-works/policy-and-administration/research/output-system-and-reports/research-outputs--definition-and-categories.html

8 Royal Society: Keeping Science Open https://royalsociety.org/policy/publications/2003/keeping-science-open/

9 OECD Ministers of Science and Technology: Access to Research Data From Public Funding: http://bit.ly/1IGubJQ

10 Open Access to scientific information: https://ec.europa.eu/digital-agenda/en/open-access-scientific-information

Towards a thriving data-driven economy: http://ec.europa.eu/information_society/newsroom/cf/dae/document.cfm?doc_id=6210

11 For an overview of the drivers for research management see the DCC guide on Making the Case for Research Data Management: http://www.dcc.ac.uk/resources/briefing-papers/making-case-rdm

12 The Data Harvest: How sharing research data can yield knowledge, jobs and growth, An RDA Europe Report 2014: https://europe.rd-alliance.org/sites/default/files/report/TheDataHarvestReport_%20Final.pdf

(RDA) explains that for Open Access to research data "*the initial investment is scientific, but the ultimate return is economic and social*". Often the main driver for opening up data is aligned with the notion of 'data as a public good', especially when funded by public money, thus providing societal and economic benefits. These include creating new jobs, fostering creativity and innovation and engaging citizens. For instance, jn a recent article in The Guardian on how open data in agriculture improves food security, Johannes Keizer of the United Nation's Food and Agriculture Organization states "*Open access to data in agriculture is one of the key issues that we consider important if you want to combat hunger and poverty.*"[13]

The 'public good' is derived primarily from 'better science'. Open Access to research data is a core component of Open Science, the movement to make scientific research, data and dissemination accessible to all. An accessible explanation of Open Science is provided by Dan Gezelter who talks of "*Transparency in experimental methodology, observation, and collection of data; public availability and reusability of scientific data; public accessibility and transparency of scientific communication; and using web-based tools to facilitate scientific collaboration.*"[14] There is little doubt that sharing data results in more rigorous science encouraging scientists to be more vigilant with the quality of their work[15]. It also supports collaboration and comparison. For instance, the Nesta and RIN report published in 2010 found that sharing of data increased the

efficiency of research due to reusability and exposure which enabled researchers to ask new research questions and potentially further science.[16.] Researcher Information offers a further explanation: "*a researcher can test a new hypothesis relatively quickly against a sizeable pre-existing set of open digital research data, originating from a whole range of different past experiments in which he or she had no direct involvement, but which can be repurposed at large scale.*"[17] In Europe, where transparency sits so high on the political and social agenda, research integrity is one of the main drivers for Open Access to research data.

One relatively recent incentive is increased citation, an idea that appeals in particular to researchers as it regards reputation. Researcher reputation is often built upon citations, h-indices, download counts and inquiry shows increased attribution and credit for research outputs which refer to openly published research data. Increased research dataset citation counts in turn contribute to the measure of a researcher's impact. Growing evidence demonstrates that making data publicly available results in higher citation rates[18], provided that the necessary repositories and standards are in place. The main theories for this are increased exposure – having a dataset visible online will increase the number of people who encounter the publication that refers to it – and the re-analysis of data which result from a particular interest around a specific research question[19]. A comprehensive

---

13 How might open data in agriculture help achieve food security? The Guardian 2013: http://www.theguardian.com/global-development-professionals-network/2013/nov/25/open-data-food-security-agriculture
14 What exactly is Open Science?: http://www.openscience.org/blg/?p=269
15 When Data Sharing Gets Close to 100%: What Human Paleogenetics Can Teach the Open Science Movement: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4370607/ - This paper provides real world examples of the importance of openness and transparency to build rigorous and reliable scientific practices in the presence of complex experimental challenges

16 Open to All? Case studies of openness in research, RIN and Nesta 2010: http://www.rin.ac.uk/our-work/data-management-and-curation/open-science-case-studies
17 Researcher Information: Unlocking the benefits of open data: http://www.researchinformation.info/news/news_story.php?news_id=1761
18 Data reuse and the open data citation advantage, Heather Pinowar and Todd Vision: https://peerj.com/articles/175/
19 These ideas are explored in the following PLOS one article Sharing Detailed Research Data Is Associated with Increased Citation Rate, Heather Piwowar, Roger S. Day, Douglas B. Fridsma: http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0000308

list of journal articles considering this area is available from the OpCit project[20].

Benefits related to sharing research data have over the past few years led to substantial legislative change and regulatory compliance illustrated in the increase in funders' data policies and institutional policy responses. A recent report on Research Data Management (RDM) by Jisc states that research data is recognised as central to research and dissemination, with openness being increasingly accepted as the default for universities. "*The opening up of research has also been supported by the transition to Open Access for peer reviewed research papers, and funders, publishers and universities have worked together to achieve Open Access. Open Access policies also encourage statements on access to the underlying research materials such as data.*"[21]

Further development has also been facilitated by the advancement of technology resulting in better opportunities for sharing data, an increased number of appropriate tools and a rise in data repositories[22]. Some institutions are beginning to incorporate data deposit into their publication repositories. The Digital Curation Centre (DCC) Institutional Engagement programme[23] worked with a number of institutions who were interested in encouraging data deposit.

Open Access to Research Data: Challenges

However, given the number of stakeholders with a vested interest in promoting Open Access to research data, progress has been slow. The recent Policy RECommendations for Open access to research Data in Europe (RECODE) Project[24] investigated barriers to uptake by considering four grand challenge areas: stakeholders values and ecosystems; legal and ethical concerns; infrastructure and technology challenges; and institutional challenges. In their final report[25] RECODE identified two overarching issues in the mobilisation of open access to research data:

- Lack of a coherent open data ecosystem;
- Lack of attention to the specificity of research practice, processes and data collections.

Clearly there remains disagreement over what a coherent open data ecosystem might look like. Definition work and discussion that has been taking place worldwide and at the Research Data Alliance[26] related to Sword, Cerif, metadata for discovery and citation data may be of interest. The lack of attention to the specificity of research practice is a more general problem. As is often the case within the Higher Education sector there are many conflicting priorities at play and resistance to change can become the norm. The academic reward system, which despite being built on the "trust, but verify" notion, focuses on publishing in a small set of established and well-recognised peer reviewed journals and continues to give little consideration on shared and open results. Challenging this system is a task for both Open Access and Open Data advocates.

---

20 OpCit: The effect of open access and downloads ('hits') on citation impact: a bibliography of studies:
http://opcit.eprints.org/oacitation-biblio.html
21 Directions for Research Data Management in UK Universities, Jisc, 2015:
http://repository.jisc.ac.uk/5951/4/JR0034_RDM_report_200315_v5.pdf
22 See Re3data for a comprehensive registry of data repositories: Registry of Research Data Repositories: http://www.re3data.org/
23 DCC Institutional Engagment Programme:
http://www.dcc.ac.uk/tailored-support/institutional-engagements

24 Policy RECommendations for Open Access to Research Data in Europe (RECODE) project: http://recodeproject.eu/
25 RECODE Deliverable D5.1: Policy guidelines for open access and data dissemination and preservation
http://recodeproject.eu/wp-content/uploads/2015/02/RECODE-D5.1-POLICY-RECOMMENDATIONS-_FINAL.pdf
26 Research Data Alliance: https://rd-alliance.org/

RECODE have delivered a policy recommendations report on Open Access to research data targeted at key stakeholders. The report recognises that when it comes to sharing research data at certain times there is a need for building consensus and transferring best practice, while at others support for diversity is required. A certain sensitivity is needed and a 'one-size-fits all' approach rarely works.

It should also be noted that whilst research integrity is a driver for many, especially those who fund research, and an honourable goal for all, there are clearly challenges to Open Science practices and the sharing of research data (for example commercial needs, reputational measurement and resourcing limitations) that require other incentives.

Open Access to Research Data Policies: A Global Perspective

In a similar vein to Open Access policy development the current situation is that Europe, North America and Oceania lead the way with regards to request or encouragement policies and statements related to sharing research data. The emerging norm is for funders to push for data release in parallel to activity happening at individual institutions. In the UK, for instance, a few funders and universities have implemented open data policies[27].

The DCC has published a series of guides (listed in the further information section) offering a historical look at worldwide approaches to Open Access to research data. Another worldwide look is taken by Science Metrix in the 2013 paper on

Open Data Access Policies and Strategies in the European Research Area and Beyond[28]. The report outlines efforts towards Open Access of scientific data in the European Research Area (ERA), Brazil, Canada, Japan and the US from 2000 onwards. It includes a list of National Open Data portals within the ERA and selected countries, though many of these focus on government data as opposed to research data.

The content of these policies varies regarding mandates but most will cover the following elements:

- **Timing**: when publication should take place
- **Data plan**: requirements for a technical management plan
- **Access and Sharing**: what exactly will need to be available for public use
- **Long term curation**: data creation and sustainability
- **Monitoring**: any monitoring that will be carried out by the funding body and guidance available
- **Storage**: details of the appropriate repository or data centre to be used
- **Costs**: where costs can be claimed from and when

In 2014 the EU-funded Support Infrastructure Models for Research Data Management (SIM4RDM) Project carried out research to establish which interventions were being used by funding agencies, research institutions, national bodies and publishers across the European Union Member States and other countries outside Europe in order to improve the capacity

---

27 DCC policy and legal: http://www.dcc.ac.uk/resources/policy-and-legal

28 Open Data Access Policies and Strategies in the European Research Area and Beyond
http://www.science-metrix.com/pdf/SM_EC_OA_Data.pdf
Note that "Open scientific research data, and increasing access to the peer-reviewed, published results of scientific research" were highlighted as areas for consideration in the G8 Science Ministers statement in 2013

and skills of researchers in making effective use of research data infrastructures. The project's landscape report resulted in a series of recommendations for funding organisations, national bodies and research institutions[29].

De-Mystifying the Data Management Requirements of Research Funders report provides an overview of current data management requirements of major US funding agencies including the National Science Foundation, National Oceanographic Data Center (NODC), National Aeronautics and Space Administration (NASA) and the National Institutes of Health (NIH)[30].

The International Council for Science: Committee on Data for Science and Technology (CODATA) has a comprehensive list of scientific data policy statements[31], which includes those from intergovernmental organisations and international organisations.

Although publishers have been less active in this area there is pressure for them to also take a stance on the publishing of research data. The Association of Learned and Professional Society Publishers (ALPSP) and the International Association of Scientific, Technical and Medical Publishers (STM), two trade associations that together represent approximately 300 non-profit and commercial scholarly publishers around the world, have released a statement on Open Access to research data[32]. The 'general principle'

data sets related to journal articles should "*wherever possible be made freely accessible to other scholars*". They see best practice by scholarly journal publishers as to "*separate supporting data from the article itself, and not to require any transfer of or ownership in such data or data sets as a condition of publication of the article in question*".

Alongside policy work an increasing number of national bodies have been established to coordinate research data management activities. These bodies are often the result of project activity and are primarily funded by government. One example of these is the Australian National Data Service (ANDS)[33], which was established in 2008 to help address the challenges of storing and managing Australia's research data. The service is a joint collaboration between Monash University, The Australian National University and CSIRO. The previously mentioned SIM4RDM argues that: "*National bodies could take the lead in drafting a national code of conduct which encourages the creation and use of data management plans.*"

In parallel to the work being conducted to promote Open Access to Research Data, there are other related activities taking place. Significant developments have taken place in the area of standards and mechanisms for citing data, for example through Datacite[34] and in the area of identifying individual researchers and contributors, for example through provision of persistent digital identifiers such as ORCID[35]. These mechanisms support the idea of datasets as a particular type of research output. In the UK, "substantial, coherent and widely admired" research data sets are now considered a valid

29 SIM4RDM: Recommendations for support of research data management:
https://www.surf.nl/binaries/content/assets/surf/en/knowledgebase/2013/SIM4RDM-recommendations_flyerDEF.pdf
30 De-Mystifying the Data Management Requirements of Research Funders: http://www.istl.org/12-summer/refereed1.html
31 CODATA scientific data policy statements:
http://www.codata.info/resources/databases/data_access/policies.html
32 ALPSP and STM joint statement on access to research data:
http://www.alpsp.org/Ebusiness/AboutALPSP/ALPSPStatements/Statementdetails.aspx?ID=55

33 Australian National Data Service (ANDS)
http://www.ands.org.au/
34 DataCite: https://www.datacite.org/
35 ORCID: http://orcid.org/

form of research output for the Research Excellence Framework submissions.

Open Access to Research Data Policies: A European Perspective

In the 2012 Communication Towards Better Access to Scientific Information[36], the European Commission announced that it would "*provide a framework and encourage Open Access to research data in Horizon 2020*". In recent years, the EC has been driving change in this area fuelled by significant research reports such as the 2010 Riding the Wave report[37], which outlined a series of policy recommendations on how Europe could gain from the rising tide of scientific data.

In response to growing recognition of the need to better manage and share research data the Guidelines on Open Access to Scientific Publications and Research Data in Horizon 2020 acknowledge that "information already paid for by the public purse should not be paid for again each time it is accessed or used, and that it should benefit European companies and citizens to the full."[38] Horizon 2020 is one of the biggest research and innovation programme publicly funded worldwide with nearly €80 billion of funding available over 7 years (2014 - 2020). Open Access to research data is a high priority for the European Commission. To ensure that projects the European Commission funds become party to opening up research data Horizon 2020 has launched an Open Data Pilot. A good summary of the pilot and further

resources can be found through OpenAIRE[39]: full details are provided in the aforementioned Guidelines on Data Management in Horizon 2020[40].

A number of Horizon 2020 programmes are required to participate in the pilot (a list is provided in the pilot guidance). Projects in other programme areas can participate on a voluntary basis. Together these areas corresponds to 20% of the overall Horizon 2020 budget in the period 2014 -2015 (about €3 billion). Projects in other areas can participate on a voluntary basis.

Projects taking part in the open data pilot are expected to deliver a data management plan (DMP) in the first 6 months of their lifecycle outlining their open research data strategy. The DMP should offer details regarding the two main Horizon 2020 mandates: that research data should be deposited into a research data repository and that measures be taken to enable third parties to access, mine, exploit, reproduce and disseminate (free of charge for any user). Note that the pilot applies to two defined types of data:

- the data, including associated metadata needed to validate the results presented in scientific publications – which should be deposited as soon as possible;
- other data including associated metadata, as specified - which should be deposited within the deadlines laid down in the data management plan

Tools such as the DCC's DMPonline[41] can support the writing of DMPs.

---

36 EC Towards better access to scientific information: http://bit.ly/1IP1hBg
37 2010 Riding the Wave: http://cordis.europa.eu/fp7/ict/e-infrastructure/docs/hlg-sdi-report.pdf
38 EU Guidelines on Open Access to Scientific Publications and Research Data: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-pilot-guide_en.pdf

39 https://www.openaire.eu/opendatapilot
40 EU Guidelines on Data Management in Horizon 2020: http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf
41 DMPonline: https://dmponline.dcc.ac.uk/

Open Access to Research Data and PASTEUR4OA

Practice has shown an increasing convergence of considerations towards Open Access to scientific information and to research data. The assurance of Open Access relies on openly published research data. Many of the challenges mentioned (objection to the academic review system, rethinking business models, achieving critical mass among researchers) apply to both approaches. One might offer a formula: Open Access + Open Data = Open Science. While the PASTEUR4OA project is primarily focusing on Open Access strategies and policy alignment in EU Member States and Aligned Countries, it is clear that work in this space should not fail to observe activities pushing for Open Access to research data. Especially in the cases where research is carried out with the European Commission's funding. Through building an international network of nodes (Knowledge Net), PASTEUR4OA has established strong ties with those who are responsible for research data in some of Europe's Higher Education institutions. PASTEUR4OA is in an excellent position to observe those working in this space and inform those wishing to embark on sharing research data.

To promote the development and reinforcement of Open Access policies, PASTEUR4OA has produced a series of advocacy resources that can be used by stakeholders developing new policies or revising existing ones. These include Open Access Policy Guidelines for both research organisations and funders[42]. The guidelines stress the increased attention that is being given

---

42 PASTEUR4OA Open Access Policy Guidelines and Template for Funders:
http://www.pasteur4oa.eu/sites/pasteur4oa/files/resource/FUNDERS_POLICY%20GUIDELINES%20FINAL.pdf and PASTEUR4OA Open Access Policy Guidelines for Research Performing Organizations:
http://www.pasteur4oa.eu/sites/pasteur4oa/files/resource/INSTITUTIONS_POLICY%20GUIDELINES_FINAL.pdf

to providing access to research data. Apart from a practical checklist for research institutions that want to implement an Open Access policy, a number of model clauses are given that can be used, which also includes:

"*Encourages researchers to deposit the research data supporting their publications in the institutional repository or in any other suitable Open Access Data repository.*"

PASTEUR4OA is in full support of other noteworthy projects working for Open Access to research data. The RECODE Project recommendations state that development of open access policies for research data need to be:

- Characterised by a partnership approach involving the key stakeholders, researchers, and institutions;
- Supported by an integrated institutional and technological data infrastructure;
- Guided by ethical and regulatory frameworks;
- Informed by research practices and processes in different fields.

One important aspect of this is the need to "*Develop aligned and comprehensive policies for Open Access to research data*". One could argue that PASTEUR4OA is making the first steps towards a framework that could ensure that this happens.

By researching Open Access policy developments through activities such as mapping policies and policy-related activities and engaging with policymakers, PASTEUR4OA will obtain a rich picture of what strategic activities encourage Open Access on the frontline. For example policy evaluation work has show that deposit of Open Access material was over four times as high (14%) for institutions with a

mandatory policy than for those without (3%)[43]. These lessons learnt can be passed on the future strategic work to encourage Open Access to research data. Such learning can help accelerate progress and shape future EC programmes and projects.

As the Horizon 2020 programme progresses it is likely that Open Access to scientific publications and research data will become further entwined as the two stalwarts of EC funded and openly accessible research.

---

43 PASTEUR4OA report on policy effectiveness:
http://pasteur4oa.eu/sites/pasteur4oa/files/deliverables/PASTEUR
4OA Work Package 3 Report final 10 March 2015.pdf

Further Information

OA for Research Data Declarations

- Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities http://openaccess.mpg.de/Berlin-Declaration
- Budapest Open Access Initiative http://www.budapestopenaccessinitiative.org/read
- Panton principles: http://pantonprinciples.org/
- RCUK Common Principles on Data Policy http://www.rcuk.ac.uk/research/datapolicy/
- CODATA scientific data policy statements: http://www.codata.info/resources/databases/data_access/policies.html
- ALPSP and STM joint statement on access to research data: http://www.alpsp.org/Ebusiness/AboutALPSP/ALPSPStatements/Statementdetails.aspx?ID=55

OA for Research Data Funders and Institutions Policies

- The Digital Curation Centre: Open Access to research data funder policies in the UK: http://www.dcc.ac.uk/resources/policy-and-legal/funders-data-policies
- DCC Infrastructure Planning and Data Curation A Comparative Study Of International Approaches to Enabling the Sharing Of Research Data: http://www.dcc.ac.uk/sites/default/files/documents/publications/reports/Data-Sharing-Report.pdf
- The Digital Curation Centre: Policy tools and guidance and international policies: http://www.dcc.ac.uk/resources/policy-and-legal/policy-tools-and-guidance/policy-tools-and-guidance

OA for Research Data Policy Guidelines

- Guidelines on Data Management in Horizon 2020 http://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/hi/oa_pilot/h2020-hi-oa-data-mgt_en.pdf
- Open Data Handbook: http://opendatahandbook.org/

OA for Research Data Books

- Delivering Research Data Management Services: Fundamentals of Good Practice by Sarah Jones, Graham Pryor and Angus Whyte, http://www.amazon.co.uk/Delivering-Research-Data-Management-Services/dp/1856049337

- Pryor (ed.), Managing Research Data - http://www.facetpublishing.co.uk/title.php?id=047562&category_code=#.VXb7lhNViko
- Joyce Ray (ed.), Research Data Management - http://www.thepress.purdue.edu/titles/format/9781557536648
- Corti et al, Managing and Sharing Data: http://bit.ly/1KVT1Om

OA for Research Data Peer reviewed articles

- Perspectives in understanding open access to research data – infrastructure and technology challenges, Lorenzo Bigagli and Jeroen Sondervan, Geophysical Research Abstracts Vol. 16, EGU2014-15149, 2014 EGU General Assembly 2014 http://meetingorganizer.copernicus.org/EGU2014/EGU2014-15149.pdf

OA for Research Data Registries and storage systems

- Re3data - Registry of Research Data repositories: http://www.re3data.org/
- Zenodo: https://zenodo.org/
- Figshare: http://figshare.com/
- CKAN: http://ckan.org/

Organisations and Projects with a focus on OA for Research Data

- Digital Curation Centre: http://www.dcc.ac.uk/
- FOSTER: https://www.fosteropenscience.eu/
- Linked Science: http://linkedscience.org/
- Open Knowledge Open Science Working Group: http://science.okfn.org/
- RECODE Project: http://recodeproject.eu
- Research Data Alliance: https://rd-alliance.org/
- Right to Research: http://www.righttoresearch.org/
- SPARC Europe: http://sparceurope.org/
- Science Commons: http://creativecommons.org/science

For further information please contact: Lieke Ploeger, lieke.ploeger@okfn.org

Annex 1 – Open Access to research data timeline

European Open Access to research data timeline

- Committee of Ministers of the Council of Europe recommended "wide public access to research results to which no copyright restrictions apply" (i.e. data)
- EC conclusions on scientific information in the digital age: access, dissemination and preservation
- Results of question 21 on EU-level policies to improve access to and dissemination of raw data from ERA Green Paper presented at a hearing in Brussels

- Panton Principles for open data formulated
- First Report of the European Research Area Board: Preparing Europe for a New Renaissance: A Strategic View of the European Research Area
- Jisc Managing research data Programme commences

- Public Hearing on access to and preservation of scientific information
- RCUK Common Principles on Data Policy released
- Open Data Research network launched, a collaborative project, coordinated by the Web Foundation and the International Development Research Centre (IDRC)
- Launch of the public Consultation on scientific information in the digital age

- EC one-day public consultation on open research data held in Brussels
- Horizon 2020 Data Pilot announced
- EU funded RECODE Project
- The first plenary meeting and official launch of the Research Data Alliance was held in Gothenburg
- EC Report on a public consultation on open research data
- EC Data Harvest Report
- European Economic and Social Committee release its Opinion on the Communication from the Commission on better access to scientific information

2008   **2010**   **2012**   **2014**

2007   **2009**   **2011**   **2013**

- EC Working Group on Text and Data Mining (TDM) Licences for Europe
- EC adopted a Recommendation on the Management of intellectual property in knowledge transfer activities and code of practice for universities and other public research organisations
- EU funded PARSE Project (Permanent Access to the Records of Science in Europe)

- Second Report of the European Research Area Board: Realising the New Renaissance – Policy proposals for developing a world-class research and innovation space in Europe 2030
- EC Riding the wave report: How Europe can gain from the rising tide of scientific data
- Open Data Research network
- RCUK Common Principles on Data Policy
- EU funded ODE (Opportunities for Data Exchange) Project
- EU funded OpenAIRE (Open Access Infrastructure for Research in Europe)

- EC clarified its policy with Frequently Asked Questions on open access to publications and data in Horizon 2020
- EC Report on the online survey on scientific information in the digital age
- EU Communication on towards better access to scientific information: Boosting the benefits of public investments in research
- EU Data Protection Regulations published

- EC public consultation launched on Science 2.0 "to gauge the trend towards a more open, data-driven and people-focused way of doing research and innovation"
- EC Report on text and data mining
- EU funded FOSTER (Facilitate Open Science Training for European Research) Project
- EU funded PASTEUR4OA Project (Open Access Policy Alignment Strategies for European Union Research)