

**Coimbra University**  
**Contribution to the Discussion on the**  
**First Draft of the UNESCO Recommendation on Open Science**  
**December 2020**

*Introductory note*

This document aggregates the set of suggestions sent by the scholarly community of the University of Coimbra (UC). It brings together nine contributions and comments, signed individually or collectively by UC internal instances. Due to the variety of contributions, some observations presented may disagree from each other.

*General observations*

UNESCO Recommendation on Open Science is a structuring, systematic and thorough document that will have a significant impact on countries, institutions and society in general, with regard to Open Science.

The text combines and harmonizes article 27 (1) of the Universal Declaration of Human Rights – “Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits”<sup>1</sup> - with the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities, from 2003: “(...) to all users a free, irrevocable, worldwide, right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship”<sup>2</sup>.

It doesn't seem to be an easy task, given that it implies fundamental changes in the way in which Science must be seen and, above all, appropriated by all, with reference to the researchers themselves and the universities. It will compel important changes that will have to be promoted by top managers in a sustainable way.

This is an absolutely fundamental initiative. The advantages of Open Science in, for example, helping in the development of the vaccines currently being tested is unquestionable, and there were several paid publications (not just scientific ones) that decided to offer articles on COVID19 in free access. This was important, but we have to see, on the other hand, that it was a very particular situation.

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<sup>1</sup> United Nations (1948), The Universal Declaration of Human Rights, <https://www.un.org/en/universal-declaration-human-rights/>.

<sup>2</sup> Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities (2003), <https://openaccess.mpg.de/Berlin-Declaration>.

It is, however, questionable that UNESCO, as a political body, would be the appropriate institution to coordinate the development of Open Science. For this purpose, an independent technical and scientific body, recruited from national and international scientific societies, will be necessary.

The document is very ambitious, bordering on utopia, with very important and meritorious objectives, but with little sense of practical reality, and with little chance of “get out of the paper”, being approved and implemented by a relevant number of countries. A more concise, realistic and practical document would be desirable for a gradual implementation of the final objective, with efficient monitoring and assessment mechanisms, for a gradual approach to the great objective of Open Science.

*Notes, comments and suggestions by each section of the draft*

**4.**

The wording leads to the understanding that these specific challenges occur only in developing countries. “Developing countries” could be exchanged for “different countries”. This is because doing research in Portugal is not the same as doing research in Denmark, England or Germany. It is also necessary to consider the different contexts, even among countries that are under the umbrella of the “developed”, but that face different challenges and, in some cases, as complicated as those experienced in some of the “developing” countries.

**8.**

A suggestion at this point is to add “and evaluation”: “open the process of scientific knowledge creation, circulation and evaluation”. This is because changing the culture of evaluation is one of the key factors, also addressed later in the document, but referring to evaluation at this moment of definition would also be important.

**9. (ii)**

It is important that all visual elements, based on data, have these same data (raw or processed) in supplementary material. A chart is a visual representation of data. The graph itself does not allow to extract the correct data for comparing studies. The table with the data will, however, allow this. It could be useful to materialize in this way: “all visual data representations (graphs, plots, etc.) should be properly accompanied by the full access to the data that resulted in such visualization”.

The wording “Data should be available in a human and machine-readable and modifiable format” expresses the relevance of accessing the data, but making their availability mandatory could be considered. It is important for everyone involved in the process, from researchers to journal editors, that data is made available.

**9. (iv)**

To include open access files/repositories within the scope of Open Science infrastructures and knowledge networks, as a complement to scientific knowledge and as an aid to open access to information.

**9. (viii)**

The multiple references to the rights of indigenous peoples in this document are questionable. Science must not discriminate against anyone, neither negatively nor positively, and the science produced by indigenous peoples has an equivalent value to that of any other source, neither less nor more. The science of indigenous peoples must pass the same scrutiny as any other knowledge and must not be distinguished as being something special.

**10.**

The researchers' great concern about reserving sensitive data is contemplated, for example, in the case of biodiversity, those that refer especially to the rare/sensitive species.

**12.**

It is questionable that the other social actors have an equal or even close weight to scientists and professional institutions and can be placed on an equal footing in their contribution. The interpretation and analysis of the data requires a level of training and knowledge that is generally not available to non-specialists.

**12. (iv)**

In view of the criteria and principles of the archive, it would be pertinent to include the category "archivists" in paragraph "12. Key actors", "point (iv) Information scientists", since archival science deals empirically and epistemologically with information and metadata.

**15.**

It is necessary to first assume that Open Access influences intellectual property (in some areas more than in others), before being able to modify that structure.

From the perspective of Open Data and its interpretation by Archival Science, considering some possibilities of interaction with other scientific domains and assuming the transversal character of the proposals, the following shared values are presented (Open Science | Open Data):

Openness,

Accessibility,  
Authenticity,  
Trustworthiness,  
Documentability,  
Equity,  
Governance,  
Integrity,  
Accountability,  
Transparency,  
Usability.

## 16.

From the perspective of Open Data and its interpretation by Archival Science, from the values shared above derive the following principles (Open Science | Open Data), followed by a brief explanation:

- The data that constitute “data files” subject to archival principles and methods, in function of their particularities and nature, must be as open as possible and as closed as necessary. (Openness)
- The data that constitute “data files” subject to archival principles and methods must be governed by the principle of the right to freedom of information, which is indispensable for the preservation of other rights and other guarantees. (Accessibility)
- The data that constitute “data files” subject to archival principles and methods must be able to document (Documentability). Documentability involves at least three different layers or dimensions of complementary values to consider: integrity, trustworthiness and authenticity. Such data must therefore, for as long as necessary, be and remain unchanged with regard to the content and the original form.
- The data that constitute “data files” subject to archival principles and methods must be able to represent society with equity in terms of diversity, variety and wealth. (Equity)
- The data that constitute “data files” subject to archival principles and methods must be able to serve information governance, which involves the development of concerted strategies and decisions to create, process, control, maintain, eliminate and recover data/information, as evidence of acts, facts, duties, rights and obligations. (Governance)
- The data that constitute “data files” subject to archival principles and methods must be presented in a clear, transparent manner, so that they not only mirror the functions and/or activities related to (information) governance and its producer, but that they can also, and above all, be subject to public scrutiny at any time. (Transparency)
- The data that constitute “data files” subject to archival principles and methods must be kept in appropriate conditions for their use and reuse, whenever required and for as long as necessary. (Usability)

- The data that constitute “data files” subject to archival principles and methods must be capable of promoting accountability, this being an undeniable component of social responsibility to which people who are responsible for them (data) are subject to. (Accountability)

#### **19.**

More innovative, disruptive, multi-nation, multilingual and multidisciplinary projects dedicated to investigating the various strands of Open Access (technological, impact, citizen science) should be promoted.

From the perspective of Open Data and its interpretation by Archival Science, some of the measures to implement the values and principles mentioned above could be:

- To develop and to implement management approaches, in accordance with the FAIR principles and with the archival principles and methods (e.g., with regard to the identification of provenance), in the “data files”.

- To implement rules, to distribute roles and responsibilities, within a general framework of policies that take into consideration the data/information lifecycle to which they report and that do not neglect the role of assessment as a transversal and capital function for their curation / preservation.

#### **19. (b)**

It is particularly unpleasant that States/Agencies demand Open Access for researchers while keeping project funding exactly the same. There should be a specific budget for this, centralized, to be used specifically in the case of Open Access (and that researchers could not spend for anything else). UNESCO should suggest this. Centralization of Open Access payment, with rules to be defined by each institution.

#### **19. (i)**

This is an aspect, related to the publishers of scientific journals, that concerns any researcher.

#### **20.**

UNESCO should help with the access to international structures, or in the creation of databases, which many do not have. It would be good to be more concrete at this level.

With regard to the intervention from the university and the institutions that support knowledge and research, it seems to us that the need for public funding for the maintenance of academic responsibility repositories should be reinforced in the text, with national and international cooperation. Common technical standards and open access applications should also be adopted to ensure:

- permanent and free online access but also offline, with replicas stored on local servers, avoiding total dependence on the Internet for local use;

- dissemination, preferably without restrictions, or with a minimum of restrictions resulting from legal aspects or unavoidable scientific imperatives;

- interoperability of computer systems and applications that avoid duplication and waste of resources in the use of platforms and repositories for access and dissemination of Open Science, open data clearly identified as being in the public domain or in public or open license, presented in a modifiable and readable format, either for the human being or for the machine, as recommended by the FAIR principles (easily findable, accessible, in an interoperable and reusable environment);
- a long-term archive with guarantee of integrity, authenticity, and coherence of sources necessary for the production of Open Science, whether they are of a scientific, historical or artistic nature.

From the perspective of Open Data and its interpretation by Archival Science, some of the measures to implement the values and principles mentioned above could be:

- To develop, systematically, in archival institutions, projects that aim to configure collections that are representative of the memory and culture of communities and subcommunities, groups and subgroups, etc. which are involved in their scope of action (in accordance with the perspective of open methods and community and participatory archives).
- To increase the possibilities for discovering - and accessing - data/information/files, through the production of description/representation instruments more aligned with the diversity, variety and wealth immersed in the community/society that they aim to describe/represent.
- To adopt free and open source platforms and software in the representation/description/preservation of data/information/files.
- To invest in strategies for massive (online) dissemination of data/information/files, especially in the institutions responsible for their preservation, in order to enhance the access, use and reuse of these data in current and future research.
- To adopt strategies for surveillance and continuity of the data considered capital and relevant for research projects, so that they can be used/reused whenever required.
- To implement the data/information assessment decision cycle (what to keep? why? for how long? with what means? with what consequences?).

It would be unrealistic to exclude commercial institutions from the entire process of providing infrastructure and resources for Open Science. It will not be possible to make all the means available and continue to fund basic and applied research without patenting the discoveries, whether in instrumentation, experimental techniques or software.

It is not clear what will be the origin and the value of all the huge investment needed in Open Science to fulfill this program. Generally, those who have the means do not have the motivation for this new paradigm.

## **20. (f)**

To reinforce the importance of the convergence between the various languages and metalanguages created by the many areas of knowledge and by the many knowledge-producing agents, for example, in the way of indexing the different “materialities” of the performative shows.

## 21.

Point 21 is fundamental, but, like others, it seems to focus more on technology, computing and scientific literacy. Anthropology and Humanities are lacking, intercultural dialogues, taking co-creation seriously. This is said elsewhere in the document, but there are tools to achieve this that have to be learned. However, the document does not specifically mention the necessary aspects of this dialogue. To focus only on computer skills, data etc. can be reducing. And UNESCO is in a privileged position to promote education at that level.

From the perspective of Open Data and its interpretation by Archival Science, some of the measures that could materialize the values and principles mentioned above are suggested:

- To develop central and transversal skills and competences (for example: planning, organizing, evaluating, manipulating data), within the scope of Data Literacy, in a cycle of actions with continuity in time and predictable results (guidelines, handbooks, courses, meetings, training actions/workshops, networking, monitoring of on-site projects, etc.).
- At the same time, to invest in experienced professionals, in standards and formats that are standardized and internationally accepted in the scope of data/information management.

## 22.

In the areas of science in general, the weight of publishers and the publishing model is something that needs to be addressed head on. In this model, scientists use taxpayers' money to produce their work, and then have to pay to publish those work in the best (and worst) publishing options. In addition, these publishers use the (unpaid) work of researchers as reviewers. That is, scientists produce content and evaluate content produced by others, all for free. And they pay to publish, values ranging from hundreds to a few thousand euros per article. It is an excellent business model. In the reference journals, those in which we are all taught to publish in order to be successful (Nature, Science, Cell and associates), it can be thousands (of euros). And those who publish in these journals are more likely to be hired, promoted, etc.

This is a known reality, but apart from some parallel initiatives (PLoS, eLife), or reactions (such as, in Germany, the cancellation for a period, and subsequent renegotiation, of SpringerNature subscriptions, or Elsevier), we have not come out much of this. This is something that UNESCO should at least try to address, as it is a complex topic.

Assessments of papers and researchers should be changed to a view that includes, in addition to metrics, a more comprehensive impact approach. On the other hand, plagiarism and fraud should be more severely punished (currently they are more in the US, much less in the EC). UNESCO should contribute to an integrated and multidisciplinary reflection in this regard.

It would be important to emphasize point 22 (b) and (c) with more concrete measures. It is very easy to say that one has to look beyond the metrics. But metrics are numbers, unquestionable. Perhaps we have to develop a non-metric assessment based, paradoxically, on more metrics, which measure the different aspects mentioned there.

UNESCO should open a dialog with publishers in order to try to find solutions to reduce costs (including paying for revision work, which is done in some cases), or to support less developed countries in editing, eventual translation and publication of results.

Also, all the commercial infrastructure linked to scientific publication and dissemination cannot realistically be excluded from the new model, as it is not replaceable in the short or medium term.

The control of “bad science”, which involves practices that violate ethical principles, in particular experimentation on animals and humans, and dishonest practices, such as falsifying results, must be strengthened.

## **22. (e)**

This is an aspect, related to the publishers of scientific journals, that concerns any researcher.

## **23.**

The publication of negative data should be valued, and UNESCO could help publishers to create a large journal/website of negative data, data that is rarely published, and whose non-publication skew the analysis. If there were a single major journal, it would have an impact and prestige that is not currently associated with this type of data. Obviously, it should be free and open access.

## **23. (b)**

From the perspective of Open Data and its interpretation by Archival Science, a measure to materialize the values and principles mentioned above could be:

- To develop and implement citizen science strategies in archival institutions open to the community, examples of which are content tagging activities, community curatorial exhibitions, as well as voluntary documentary transcription/interpretation, all with potential to make the data/information/files more accessible and identifiable with the people around them (in accordance with the perspective of open methods and community and participatory files).

## **23. (c)**

From the perspective of Open Data and its interpretation by Archival Science, a measure to materialize the values and principles mentioned above could be:

- To develop, in partnership with the producers of research data, strategies and solutions that make their admissibility (of such data) in the Archives feasible, in order to promote their curation/preservation and make them usable/reusable for the time considered necessary.

**23. (e)**

A non-ideal solution, considering the experience obtained in the context of the COVID-19 pandemic is, for example, that every year priority areas of Open Access are defined, in order to try to solve a pressing problem of Humanity. It would be symbolic, and could be mobilizing, assessing the impact at the end, to gauge the value of Open Access.

**24. (a)**

To promote interoperability and interconnection between national and international cataloging/indexing systems, generating aggregating devices, such as SIBMAS ([www.sibmas.org/](http://www.sibmas.org/)).

**25. (b)**

There is a lack of reference, a stimulus to the monitoring and to sharing also the obstacles found in this process of universalizing Open Science as a standard practice. There are several obstacles of different kinds, but many of them are common to different countries/regions/contexts.