BARCELONA DECLARATION ON OPEN RESEARCH INFORMATION

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PREAMBLE

Vast amounts of information are being used to manage the research enterprise, from information about research actors and their activities to information about inputs and outputs in the research process and signals of the use, esteem, and societal impact of research. This information often plays a vital role in the distribution of resources and the evaluation of researchers and institutions. Research performing and research funding organizations use this information to set strategic priorities. The information is also indispensable for researchers and societal stakeholders to find and assess relevant research outputs.

However, a large share of all research information is locked inside proprietary infrastructures. It is managed by companies that are accountable primarily to their shareholders, not to the research community. As research community, we have become strongly reliant on closed infrastructures. We have ended up assessing researchers and institutions based on non-transparent evidence. We are monitoring and incentivizing open science using closed data. We are also routinely making decisions based on information that is biased against less privileged languages, geographical regions, and research agendas. To advance responsible research assessment and open science and to promote unbiased high-quality decision making, there is an urgent need to make research information openly available through open scholarly infrastructures. Openness of research information must be the new norm.

We, the undersigned, believe that the research information landscape requires fundamental change. We commit to taking a lead in reforming the landscape and transforming our practices. To this end, we commit to (1) making openness of research information the default, (2) working with services and systems that support and enable open research information, (3) supporting the sustainability of infrastructures for open research information, and (4) working together to realize the transition from closed to open research information.

These four commitments are presented below. Further background and context is provided in Annex A. Definitions of key concepts can be found in Annex B.

COMMITMENTS

As organizations that carry out, fund, and evaluate research, we commit to the following:

1

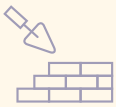
We will make openness the default for the research information we use and produce

- Openness will be the norm for the research information we use, for instance to assess researchers and institutions, to support strategic decision making, and to find relevant research outputs.
- Openness will be the norm for the research information we produce, for instance information about our activities and outputs, with an exception for information for which openness would be inappropriate ('as open as possible, as closed as necessary').

2

We will work with services and systems that support and enable open research information

- For publishing services and platforms, we will require that research information generated in publication processes (e.g., metadata of research articles and other outputs) be made openly available through open scholarly infrastructures, using standard protocols and identifiers where available.
- For systems and platforms for the internal management of research information (e.g., current research information systems), we will require that all relevant research information can be exported and made open, using standard protocols and identifiers where available.

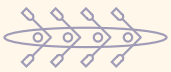


3

We will support the sustainability of infrastructures for open research information

- We take responsibility for supporting infrastructures for open research information, for instance by participating in community building and community governance and by providing fair and equitable contributions to the financial stability and development of these infrastructures.

- We expect the infrastructures that we support to implement good practices for community governance and sustainability (e.g., Principles of Open Scholarly Infrastructure).



4

We will support collective action to accelerate the transition to openness of research information

- We recognize the importance of sharing experiences and coordinating action to promote a system-wide transition from closed to open research information.

- To facilitate this, we support establishing a Coalition for Open Research Information and strengthening collaboration with other related initiatives and organizations.

ANNEX A
BACKGROUND AND CONTEXT

Closed research information leads to black-box decision making

Too often, decision making in science is based on closed research information. Information is locked inside proprietary infrastructures run by for-profit providers that impose severe restrictions on the use and reuse of the information. Errors, gaps, and biases in closed research information are difficult to expose and even more difficult to fix. Indicators and analytics derived from this information lack transparency and reproducibility. Decisions about the careers of researchers, about the future of research organizations, and ultimately about the way science serves the whole of humanity, depend on these black-box indicators and analytics. Without open research information, it is difficult, if not impossible, to scrutinize these indicators and analytics and to have an informed debate about their strengths and weaknesses. Basic standards of accountability cannot be met, and academic sovereignty is at risk.

There are many closed research information infrastructures. Well-known examples are the Web of Science and Scopus databases, which play an important role in research assessment and resource allocation in many countries. These databases provide metadata for scientific publications (e.g., title, abstract, journal, authors, author affiliations, funders, etc.), but they impose severe restrictions on the use of this metadata and make the metadata available only to organizations that pay hefty subscription fees. Indicators and analytics based on these databases (e.g., publication and citation statistics, journal impact factors, university rankings, etc.) lack transparency and reproducibility.

Transparent high-quality decision making requires open research information

At a time when decision making in science is increasingly guided by indicators and analytics, addressing the problems of closed research information must be a top priority. Decisions should be informed by open research information: information that is free to access, without restrictions on how it can be used and reused. To enable linking of information from different sources, open research information should make use of persistent identifiers such as DOIs (Digital Object Identifiers), ORCIDs (Open Researcher and Contributor IDs), and ROR (Research Organization Registry) IDs to reference research outputs, researchers, research organizations, and other entities. Infrastructures for open research information should be governed by relevant stakeholders in the academic community.

Openness of research information ensures that all stakeholders have full access to information that is of relevance to them. This is vital for high-quality decision making in science. It also enables information from different sources to be linked and integrated, so that decision making can take full advantage of all available information and can be based on a diversity of perspectives and an inclusive understanding of the issues at stake. In addition, when researchers or research organizations perform additional data curation, the enriched information resulting from this can again be shared openly, enabling everyone to benefit from it. In a research assessment context, openness of research information guarantees that not only those performing an assessment but also those being assessed have access to all 'evidence' considered in the assessment, offering the transparency and accountability that are crucial to foster responsible assessment practices.

Support for open research information is rapidly increasing

The importance of openness of research information is widely recognized, for instance by the research assessment reform movement. The San Francisco Declaration on Research Assessment (DORA), supported by about 3000 organizations and over 20,000 individuals globally, calls on publishers to "remove all reuse limitations on reference lists in research articles and make them

available under the Creative Commons Public Domain Dedication". The Leiden Manifesto for research metrics advises that researchers who are being evaluated should always be able "to verify data and analysis". The EU Council has adopted conclusions on research assessment and implementation of open science stating "that data and bibliographic databases used for research assessment should, in principle, be openly accessible and that tools and technical systems should enable transparency". The more than 600 organizations that have joined the Coalition for Advancing Research Assessment (CoARA) have signed an agreement that emphasizes the need to ensure "independence and transparency of the data, infrastructure and criteria necessary for research assessment and for determining research impacts". A large number of organizations and individuals in Latin America and the Caribbean have signed a declaration highlighting the importance of "initiatives and pronouncements against commercial barriers that limit access and participation in relation to scientific information". The declaration stresses that research assessment should use "databases which reflect both the production disseminated in international repositories as well as that which is included in regional and local databases".

Going beyond research assessment, SPARC (Scholarly Publishing and Academic Resources Coalition) warns that "complex infrastructure that is critical to conducting the end-to-end business of the university" is increasingly owned by companies that "can invisibly and strategically influence, and perhaps exert control, over key university decisions". In its roadmap for action, SPARC advises research organizations to respond by identifying "a structured set of principles that represent a foundation and a compass for action" and by operating in more coordinated and aligned ways.

In line with this recommendation, the academic community in the Netherlands has developed guiding principles for open research information. These principles aim to "open up research metadata and data analytics", which is essential "to cope with the increasing commercial development across the entire research life cycle without transparency or clarity on whether this supports the interests of the research community".

Openness of research information, and specifically of publication metadata, has also been promoted by the Initiative for Open Citations (I4OC) and the Initiative for Open Abstracts (I4OA) as well as the Metadata 20/20 initiative. Likewise, the FAIR (Findability, Accessibility, Interoperability,

and Reusability) principles have played a crucial role in advancing the availability of open metadata for research data. In its Recommendation on Open Science, UNESCO highlights the importance of "open bibliometrics and scientometrics systems for assessing and analysing scientific domains". A growing number of infrastructures for open research information have also adopted the Principles of Open Scholarly Infrastructure.

Supported by the above developments, research information is increasingly made openly available. A number of open research information infrastructures for instance offer alternatives to closed databases. In addition to infrastructures provided by organizations such as Crossref, DataCite, and ORCID, this also includes 'aggregator' infrastructures such as OpenAlex, OpenCitations, and OpenAIRE, as well as discipline-specific infrastructures such as PubMed and Europe PMC, and local and national infrastructures such as La Referencia, SciELO, and Redalyc.

We are getting close to a tipping point in the transition from closed to open research information. But to reach this tipping point, more concerted action is needed. We therefore call on all organizations that carry out, fund, and evaluate research to support the transition to open research information and to sign the Barcelona Declaration on Open Research Information.

ANNEX B
DEFINITIONS

Research information

By *research information* we mean information (sometimes referred to as metadata) relating to the conduct and communication of research. This includes, but is not limited to, (1) bibliographic metadata such as titles, abstracts, references, author data, affiliation data, and data on publication venues, (2) metadata on research software, research data, samples, and instruments, (3) information on funding and grants, and (4) information on organizations and research contributors. Research information is located in systems such as bibliographic databases, software archives, data repositories, and current research information systems.

Open research information

By *open research information* we mean research information that is free to access and free of restrictions on reuse. Openness of research information is a spectrum, not an absolute. Just like research data should ideally adhere to the FAIR principles for Findability, Accessibility, Interoperability, and Reusability, open research information should ideally also follow these principles. If the highest levels of Findability, Accessibility, Interoperability, and Reusability are realized, research information is both open and FAIR. This for instance requires:

- The use of standardized protocols and persistent identifiers to support high levels of Findability and Interoperability
- Lodging of metadata in widely used repositories and transfer systems to support Findability and Accessibility

- The application of a Creative Commons CC0 waiver or public domain dedication as appropriate to support Interoperability and Reusability
- Transparency of processing and provenance to support Interoperability and Reusability
- The use of infrastructures that provide standard and open interfaces

Research information that cannot be ethically shared, including information that has privacy implications, should not be made open. In some cases, aggregated forms of privacy implicating research information can be made open. However, this should be assessed on a case by case basis in the context of relevant regulations and legal requirements.

Publishing

By *publishing* we mean the act of making the outputs of research generally available for consumption, use, and critique. This includes, but is not limited to, the formal publication of textual outputs such as journal articles or scholarly books, the posting of reports and other non-peer-reviewed outputs, and the sharing of research data and research software through appropriate repositories. It may also include the release of creative works, including sculpture, visual art, film or video, or other artifacts, where they are intended to represent or communicate the results of a research process.

It is intended that the meaning of *publishing* includes cases where the audience is limited, for instance where access is limited to subscribers, but does not include private and confidential reports or other documents that are not intended for general circulation. Publishing is separate to *archival*, where the intent is long term preservation. Some, but not all, publishing platforms also support archival through the publishing process.

Scholarly infrastructures

By *scholarly infrastructures* we mean infrastructures through which research information is shared. A precise definition of infrastructures is challenging. A key characteristic of infrastructures is that they are foundational. For instance, they are used by a diversity of actors for differing purposes, other systems depend on them, and they are built to be shared by a community of users. Another characteristic of infrastructures is that they are not visible to end users of services, with dependencies only becoming clear when infrastructures fail.

Open scholarly infrastructures

By open scholarly infrastructures we mean scholarly infrastructures that provide trustworthy assurances of openness, community accountability, stability, transparency, and reliability. A commitment to adhere to the Principles of Open Scholarly Infrastructure (POSI), with regular updates on performance and improvements, provides a means by which a scholarly infrastructure can provide assurances to the community that it qualifies for the level of trust accorded to an open scholarly infrastructure.

BARCELONA DECLARATION ON OPEN RESEARCH INFORMATION

www.barcelona-declaration.org

The Barcelona Declaration on Open Research Information was prepared by a group of over 25 research information experts, representing organizations that carry out, fund, and evaluate research, as well as organizations that provide research information infrastructures. The group met in Barcelona in November 2023 in a workshop hosted by SIRIS Foundation. The preparation of the Declaration was coordinated by Bianca Kramer (Sesame Open Science), Cameron Neylon (Curtin Open Knowledge Initiative, Curtin University), and Ludo Waltman (Centre for Science and Technology Studies, Leiden University). Organizations that would like to know more about the Declaration or that wish to sign the Declaration are welcome to reach out to contact@barcelona-declaration.org