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Cartographies for an inclusive Open Science

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CARTOGRAPHIES FOR AN INCLUSIVE OPEN SCIENCE

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Abstract

The Call for the STI Conference held in September 2024, in Berlin, argues that there is a variety of processes of openness among different communities and stakeholders which pose questions about the interaction of openness and closedness. It stimulates the participants to ask how much closedness is embedded in openness and vice versa and how to measure these intertwined phenomena. This keynote has been framed in these basic concerns and intends to advance towards the intersection with inclusiveness, considering that openness is necessary but not sufficient to achieve a more equitable and effective scholarly communication globally. In the convergence of field approach and structural heterogeneity, we build a conceptual framework to assess the combinations observed in the space of open science, and the stakeholders that represent forces towards inclusiveness or exclusiveness.

Exploring the main indicators of inclusive openness, 7 cartographies are proposed for a global mapping and the discussion of the main issues at stake towards a just transition to open science: 1) a comparison between the distribution by country of repositories of published output and primary data repositories, 2) a mapping of the Current Information systems (CRIS) and their different developments at the national and institutional level, 3) a cartography of persistent identifiers of digital resources comparing DOI and ARK, 4) a cartography of persistent identifiers for active researchers (ORCID) by country and its weak representation of the national research communities, 5) a comparison of the coverage of identifiers of research organizations (ROR) with a national database of organizations, 6) a cartography of indexed journals with no-fee for publishing or reading and 7) a mapping of multilingualism in scholarly publishing, by platform. Finally, some study cases are discussed to show examples of the limited inclusiveness of the current state of open infrastructures and publishing platforms.

Keywords

Inclusive open science, cartographies, commercial exclusiveness, no-fee journals, multilingualism, open infrastructures

CARTOGRAPHIES FOR AN INCLUSIVE OPEN SCIENCE[1]

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The Call for the STI Conference held in September 2024, in Berlin, argues that there is a variety of processes of openness among different communities and stakeholders which pose questions about the intersection of openness and closedness. It stimulates the participants to ask how much closedness is embedded in openness and vice versa and how to measure these intertwined phenomena? It argues that it is necessary to discuss how to measure openness and to what extent this shapes the discourse about open science in policy and practice. This keynote has been framed in these basic concerns and intends to advance towards the challenge posed recently by Pinfield (2025) regarding that openness to publications and research data are necessary but not sufficient to achieve a more equitable and effective scholarly communication globally.

During 2020 and 2021, I had the honor to serve as the chair of the UNESCO Advisory Committee that prepared the draft project of the Recommendation of Open Science, approved by the 41st UNESCO Conference, in November 2021. The discussions with the thirty experts that were part of this committee, representing different regions of the world, show us soon the complexity of the idea of openness in the context of the world's economic, technological, academic, and social asymmetries. The challenges of scientific openness, soon we could see, changed significantly from North to the South, given the unequal development of digital infrastructure, but also from West to East, within each region and even within each country. In the so-called non-hegemonic countries, there are different experiences of regionalization, diverse types of inequalities and asymmetries. For example, in Africa and Latin America, quite opposite relations between the private-public sectors can be observed and successful national open science policies in Asia differ much from other countries in the same region.

The most developed dimension of Open Science by the time of the preparation of the Recommendation was Open Access to scientific publications and the public concern for it seemed boosted by the pandemic of COVID-19. But paradoxically, it was already a contested issue. As noted by several studies around the 20-year balance from the Budapest Open Access Initiative (BOAI 2002) open access was born with a noble intention but evolved as a flawed reality (Tennant et al. 2019; Frank, Foster & Pagliari, 2023). Vested interests within the academic publishing sector, particularly publishers of highly esteemed journals (e.g. Impact Factors above 10–20), had a great incentive to change their funding model to hybrid, since their subscriptions – although costly – are still coming in, and their manuscript submissions continue apace, far above their publication capacity. A dynamical drift of scholarly journals that were born in Open Access

[1] This paper was first delivered as a keynote in the STI Conference held in Berlin, September 17-20 (2024), organized by the Humboldt University of Berlin (Robert K. Merton Center for Science Studies), the German Centre for higher education research and science studies (DZHW) in collaboration with the European Network of Indicator Developers (ENID). I am greatly thankful to Manuel Bruccoleri Ochoa for his technical assistance to build the cartographies presented in this work.

or mega-journals demanding increasingly high payments for Article Processing Charges (APC) overshadowed the achievements of the open access movement.

In this context, one of the main concerns for all the experts that shared this rich intellectual debate was how to foster equality while preserving diversity and interculturality as main axis of the definition and the values of Open Science. Accordingly, "openness" *of what and to whom* was at the center of our discussions while serving for the committee. After two years, the UNESCO Open Science Outlook affirms that "*for open science to reach its full potential, it must be an equitable global phenomenon. While the findings point to increases in the adoption of open science practices across regions and disciplines, this growth has been uneven. Gaps persist along existing socio-economic, technological, and digital divides between countries* (UNESCO 2023). In this presentation, I will attempt to chart these gaps pointing out not only the existing inequalities and asymmetries, but also the advantages of Southern countries in fostering a path towards science as a common good. Afterwards, I will focus on our research in progress at the *Research Center on the Circulation of Knowledge* (CECIC, for its Spanish acronym)[2] regarding the use of national databases to describe research communities. Finally, I will show the results of the coverage studies we have made in comparative studies of Brazil, Argentina and Uruguay.

1. The tensions between inclusive openness and exclusive closedness

The adoption of the 2021 UNESCO Recommendation on Open Science has prompted the integration of open science provisions in existing or revised STI policies. It has also sparked the development of specific open science policies/strategies/action plans and/or roadmaps, in different regions. Since it was adopted, at least eleven countries have adopted appropriate policies, strategies, and legislative frameworks (namely Austria, Colombia, Cyprus, Ireland, Italy, Latvia, Lesotho, Romania, South Africa, Spain and Ukraine). Four countries have included the principles of open science in their national STI policies (namely Estonia, Ghana, Sierra Leone and Slovenia), and over ten are currently developing open science policies based on UNESCO's Recommendation, notably in Africa, but also in Latin America and Europe. A growing number of countries have policies that pertain to at least one aspect of open science. Commonly, these begin with an open access policy addressing publications and/or research data, then transitioning to a more comprehensive open science policy or national strategy. Several countries are also incorporating the values and principles of open science in their existing science technology and innovation policies (UNESCO 2023).

Across regions it is noticeable the diverse drive related to the development of open digital research infrastructure. Europe and Latin America have strong continental initiatives and/or networks in development. We also see some trans-continental cooperation between Latin America, Europe, and Africa. Recent legal developments in the EU and their potential to both advance and also perhaps complicate open science practices are also noteworthy. A key focus in Latin America and the Caribbean is the approach to knowledge as a public good (Babini & Rovelli 2020). In the United States, the federal government is one of the most important drivers of open

[2] For more information visit the CECIC website: https://cecic.fcp.uncuyo.edu.ar/en/

science practice, but the scope and core priorities differ (Steinhart et al 2024). There is a growing interest from regional and subregional bodies to foster open science efforts along with the transformation towards responsible research assessment. There are around a dozen international and regional declarations by different organizations that call for promoting a transition towards the principles of open science.

The most recent Declaration of Barcelona (2024) addresses openness by taking a lead in transforming the way research information is used and produced. Its preamble states that "open research information enables science policy decisions to be made based on transparent evidence and inclusive data. It enables information used in research evaluations to be accessible and auditable by those being assessed. And it enables the global movement toward open science to be supported by information that is fully open and transparent". To fulfill this purpose, the signatories adopted four commitments that contribute to the necessary changes in incentives for responsible evaluations. Among these commitments https://barcelona-declaration.org/commitments/ they take responsibility for supporting infrastructures by participating in community building and community governance, providing fair and equitable contributions to the financial stability and development of these infrastructures.

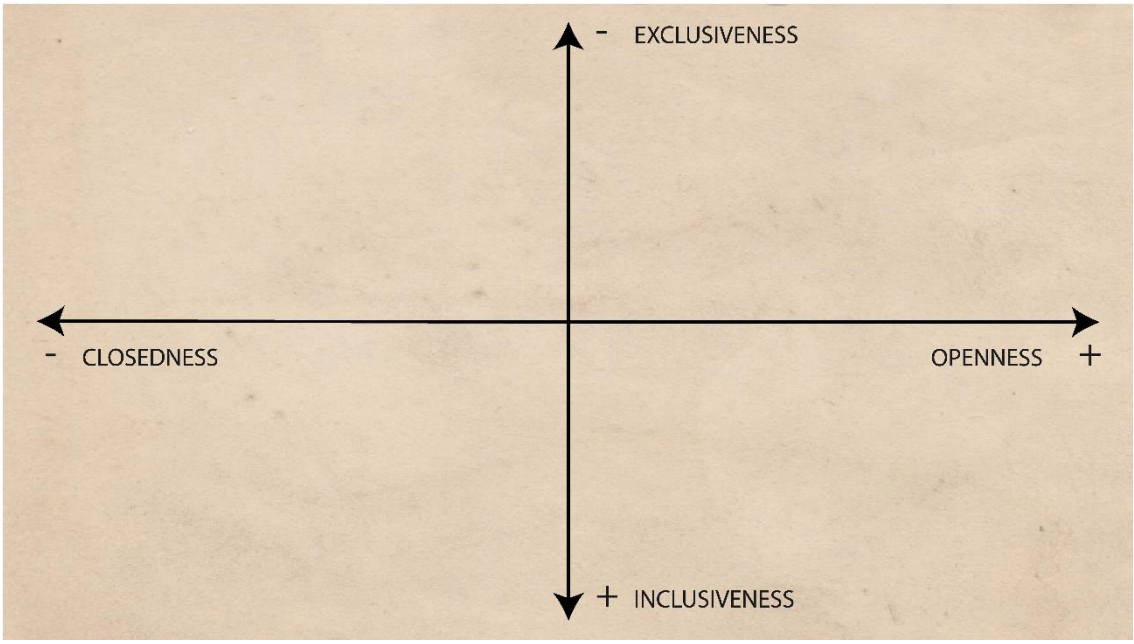
However, the development of transparent and sustainable open infrastructures does not guarantee a global advancement of inclusive open science, above all because the most recognized publishing platforms and indexing services are managed by big commercial publishers that require "exclusive" goods to sell in the scholarly publishing market. Pinfield (2025) delves on 3 facts that have signified backwardness in terms of inclusiveness in the movement of open access: a) commercial OA imposes inappropriate and unsustainable business and publishing models on researchers from low-resource regions and their institutions, with the system dominated by large corporations based in Western Europe and North America; b) this commercial development of OA is also portrayed as perpetuating or exacerbating inequities inherent in the scholarly communication system, research evaluation system, and the academy in general, limiting the participation of people in LMICs, and c) OA is seen by some critics as a way of dominating LMICs with alien and oppressive forms of knowledge associated with the Global North, devaluing indigenous knowledge forms, and creating epistemic injustice.

Accordingly, there are different paths towards open science, co-existing conflictingly at the global scale, and the tension between them is not only determined by the degrees of openness/closedness but related to the poles of inclusiveness/exclusiveness. Figure 1 shows different combinations in this space of conflict that we organize in resemblance to the way Bourdieu describes the properties of a given field[3]. To the right we see the features of openness and to the left, the characteristics of closedness. But combined with the vertical axis and read more practically from the center, where both axes cross each other, we can see four quadrants. The upper quadrants are featured by exclusiveness, pushed by the commercial actors or by the traditional asymmetries of the world academic system. In the lower quadrants, on the contrary, circulate high degrees of inclusiveness but with different limitations to openness, due to sovereignty issues or the protection required by subaltern groups.

[3] To build this analytical space normally I would normally recur to Multiple Correspondence Analysis, but at this stage of my research, the cartographies involve several individuals, institutions, countries, indexing services and other organizations that foresee the need for several MCA in the future.

Figure 1

The axes of inclusiveness and openness



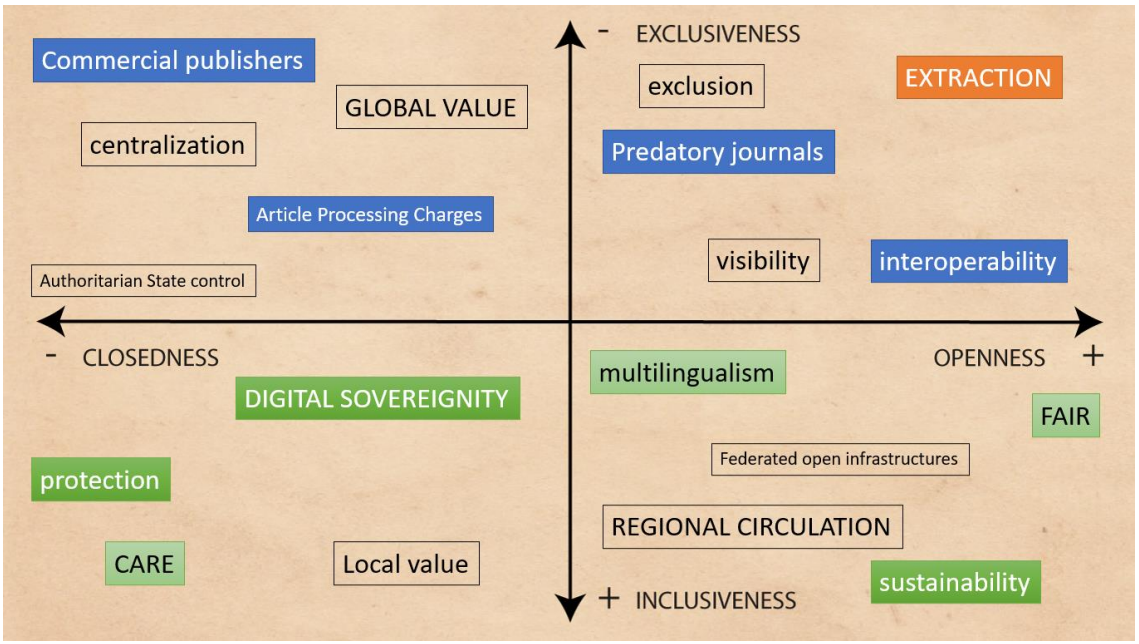
Analyzed by quadrant, the space is organized by opposite poles, firstly, featured by the exclusive-closedness headed by the big commercial publishers that dominate in the constellation made of the Scopus-Clarivate publishing platforms (CRIS closed commercial management systems are also centralized). The increasing concentration of scholarly services and the fact that they still hold great part of the credibility of the academic community makes this sector also dominant in terms of global value for research assessment. Consequently, the structural bias of these global databases deepens the exclusion of great part of the scientific results published outside the high-impact journals, in languages different from English and pushing aside bibliodiversity. Contrary to inclusiveness, these commercial publishers need to offer exclusive goods and services that can guarantee access to the global value of excellence, which is (by definition) scarce and exceptional. The upper right quadrant is organized by the main conditions for openness, such as interoperability, FAIR principles. But it leads to severe exclusion in the frame of the gold business model where open access journals transfer the costs of publishing to individual authors that are affiliated to institutions that cannot afford read & publish agreements. This is why the prices of APC keep rising in those journals that have acquired high impact factors. Under these circumstances, journals with a long-standing tradition of prestige like Nature can elevate their profit rate indefinitely. There are several studies that quantitatively measure what this expenditure means in Latin American countries such as Colombia, Argentina, Brazil and Chile, certifying its upward trend (Pavan and Barbosa, 2018; Vélez Cuartas et al, 2020; Krauskopf, 2021; Beigel and Gallardo, 2022). Other deeper consequences have also been pointed out, such as the growth of predatory journals, the intrusion of the commercial publishers with editorial decisions and the

increasing loss of academic autonomy (Debat and Babini, 2019; Öztürk & Taşkın, 2024; Beigel, 2024).

Many think that one of the drivers of the exclusiveness that features gold OA and the growth of commercial publishing was the Plan S and the various incentives and policy regulations to boost open access in the European area. Indeed, this regional actor played a significant role in a rapid change that affected the dynamics of scholarly publishing not only in Europe but globally. However, fair is to recognize that these negative effects of Open Access have been considered by the Coalition S and currently they are fostering several global projects to boost diamond publishing. During the STI Conference we participated in discussions related to the new strategy by Coalition S and the DIAMAS project also shows a shift in the organization's direction. The underlying doubt is always regarding the limits or the maneuver margin that the UE open access strategy has in regard to the interests of the commercial publishers. However, the most recent initiatives show a concern over inclusiveness in scholarly publishing: the Global Diamond Summit in Mexico 2023, the Global Diamond Open Access Alliance fostered by UENSCO and the upcoming Second Summit to be held in December 2024 at Cape Town.

Figure 2

The space of inclusiveness and openness



Frankly opposed to exclusive closedness is inclusive openness which is represented in the right lower quadrant in Figures 1 and 2. The main drivers for this path in open Access have been the regional publishing platforms and portals such as Latindex, Scielo, Redalyc, Biblat, AJOL, that have established conditions for quality journals in multiple languages. Given the fact that the established hierarchies in the academic world give scarce value to these journals, inclusive open

science can be less visible and featured by regional circulation. However, it embodies a critical effort to preserve interculturality and foster the human right to science.

In the left lower quadrant, we see inclusive closedness, a pole that is featured by a restricted circulation of the knowledge which, on the other hand, is mostly locally valued. Among these we may see scientific output that is disseminated in non-indexed journals, numerous initiatives for the management of scientific information and digital platforms that are created without permanent identifiers and many other similar experiences. During the discussions held in the UNESCO Advisory Committee for Open Science, the risks of openness were discussed towards the need to protect subaltern communities, indigenous knowledge, or scientific information subject to extraction under unequal power relations: *open all that is possible and close only what is necessary was the basis of the debate*. But this was critical not only to *protect*, but also to *respect* the rights of the indigenous groups to the autonomous government of their native knowledge. The CARE principles were born I the midst of this tension and today represent one of the main guidelines for a transition to inclusive openness: collective benefit, authority to control, responsibility, ethics https://www.gida-global.org/care

The predominantly local value of these still closed research experiences is related to a deeper problem, because structural inequalities in the production and circulation of knowledge have had repercussions on the very criteria for evaluating science at a global level, reinforcing the hierarchization of knowledge produced in central countries and its consequent subordination of knowledge generated in non-hegemonic countries. Kraemer-Mbula et al. Eds. (2020) argue that this process of universalization of the idea of “excellence” encouraged many funding agencies and governments in Southern countries to demand certain levels of performance in journals with a high impact factor as an indicator of quality. The growing influence that this had on funding decisions, and success in academic careers promoted a growing distancing from social needs and the local research agenda.

Closedness is not only featured by the need to protect subaltern groups or potentially extractive scientific information but can be also featured by state governments to defend digital sovereignty. In a democratic perspective, governments may need to protect citizens’ personal data and businesses’ economic interests in an information economy. In an authoritarian regime, the concept has been embraced to limit academic freedom and exert social control over the citizens Steinhart et al (2024) argue that digital sovereignty can be defined as the right of a nation, region, or other political entity to assert control over its digital infrastructure and data, on its own behalf and on behalf of its citizens. From the development of the European strategy for data to the CHIPS and Science Act in the US, recent years saw a growing conversation in this realm, prompted by nations will to (re)gain control over their digital infrastructure and data. Taken to its extreme, this phenomenon has the potential to extend the “Galápagos Syndrome” by which infrastructures become separated and segregated into smaller, detached and non-interoperable components (Steinhart et al. 2024).

As we see, the tensions in the development of an inclusive open science not only revolve in national open science policies, unequal material resources or commercial interests. Data governance plays a key role in contested global projects regarding the integration of digital platforms. Deep debates surround the benefits or disadvantages of centralized open infrastructures, while a more inclusive and democratic rout seems to emerge from the idea of

federated infrastructures. But this leads us to one of the most critical dimensions of the digital divide that determines the possibilities for each research community or country to (re)gain control over the data produced and expand its visibility in the global scientific realm: inclusiveness in the development of repositories and CRIS systems.

2. A cartography of open infrastructures: repositories and information systems by country

Openness of scientific output and research data is highly dependent on the development of repositories, an arena in which the digital divide imposes severe restrictions to certain countries and institutions and disproportionate advantages to others. This gap can even lead to the extraction of scientific data from the peripheries by commercial entities, rich institutions or abusive individuals. Sellanga, Steinhart, Tsang & Wako (2024) remind us that the longest-lived Open infrastructures (OI) are the pre-print repository *arXiv* (1991) and the publishing platform *Érudi*t (1998). To this we should add SciELO, the Latin American publishing platform that was created in also in 1998 and its immediate predecessor BIREME and LILACS (Beigel et al 2022). Soon afterwards other relevant infrastructures started between 2000–2005 including two major repository platforms (DSpace and Fedora) as well as the publishing platform Open Journal Systems. Other key OIs related to open access that were started in this time frame include the Directory of Open Access Journals and Sherpa Services (tools for navigating publisher and funder open access policies and finding open access repositories). Also dating to the early 2000s, Creative Commons sought to simplify and standardize the process of granting permission to reuse creative works. Also COUNTER, Crossref, Archival Resource Key, and Journal Article Tag Suite represent important advances in the development of standards and persistent identifiers for use in publishing and repositories (Sellanga, Steinhart, Tsang & Wako 2024).

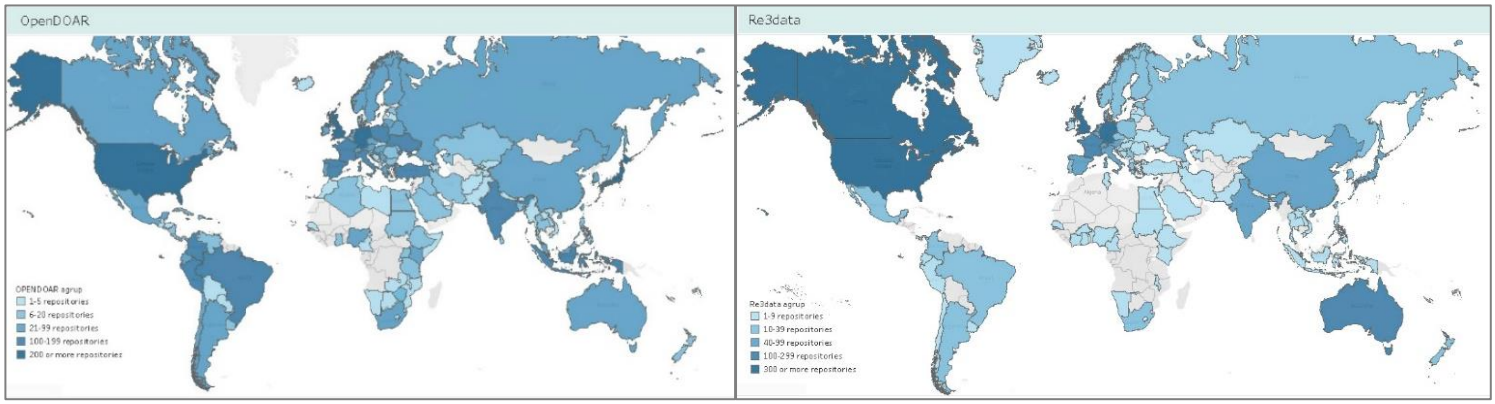
Da Silviera et al (2023) developed a taxonomy for open science in which open infrastructures include basically repositories, publishing platforms and persistent identifiers. *The survey of Recent Open Science Policy Developments*. *Invest in Open Infrastructure* (2024) described 57 fully operational infrastructures that meet one or more eligibility criteria: meets the definition of open source software (OSS); primarily or exclusively distributes openly licensed (open access) content; Is free to use by anyone (free of charge or other restrictions); Is community governed and is transparent in its operations and finances; Is operated by a non-profit or non-commercial entity. The report https://doi.org/10.5281/zenodo.10934088 establishes that 32 OIs are located in North America and 17 in Europe. 4 reported no location, so only 5 are developed outside the most developed global scientific hubs. This is consistent with the findings by Bezuidenhout & Havemann (2020), whose exploration of 242 digital tools for open science had a similar distribution.

We will concentrate our first cartography in mapping repositories, digital infrastructures that generally grew within the framework of university libraries during the last 50 years. They exist thanks to the tireless efforts of librarians who had first catalogued and then digitized the production of their professors and researchers, making these contents available to society. In Figure 3 on the left-side map we see an important development of the repositories in North America and Western Europe, a relevant presence in Latin America and a more incipient number of output repositories in other Southern regions. Differently, in the right-side map, when we

compare with Re3data (a global registry of open data repositories that covers all academic disciplines), the distribution drops to light blue or white because these repositories have greater technical complexity.

Figure 3

Cartography of open access repositories comparing output and research data

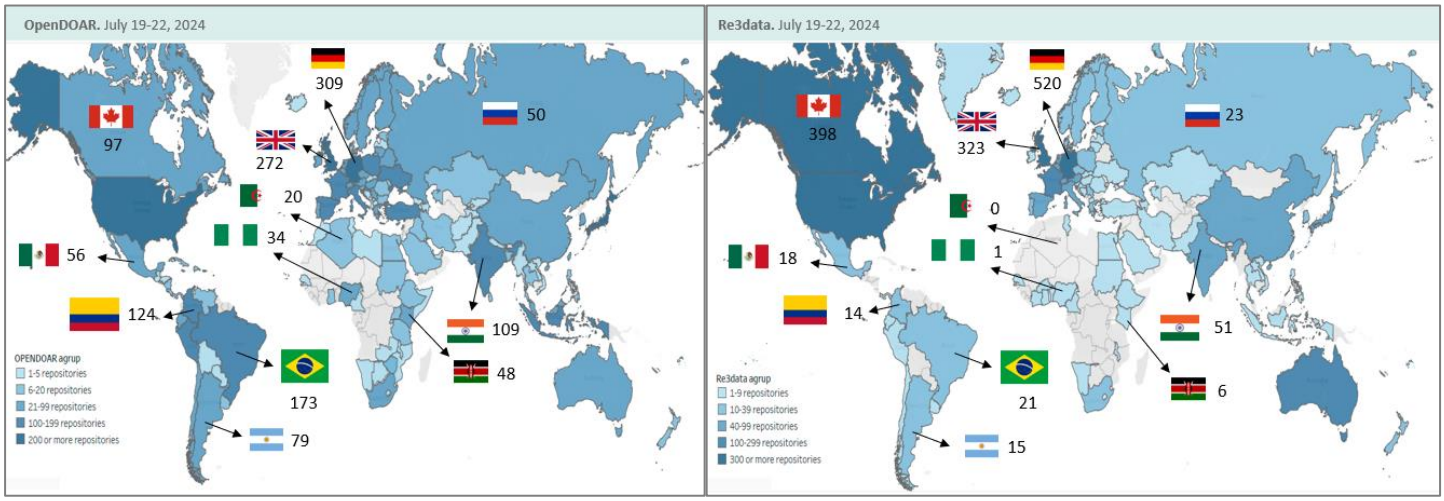


Data Sources: https://v2.sherpa.ac.uk/view/repository_by_country/Argentina.software_name.html; https://www.re3data.org/browse/by-country/ Data extracted 19- 22 de july, 2024.

The digital divide emerges quite pristinely. In Figure 4, we added some country flags for the reader to compare the difference in the number of institutional repositories observed for example in Latin America, a region well positioned in terms of output repositories but clearly diminishing in the available data repositories. Argentina diminishes from 79 to 15, Colombia 124 to 14, Nigeria 48 to 6 and India 109 to 51. Meanwhile, Canada grows from 97 to 398, UK from 272 TO 323 and Germany 309 to 520. In this infrastructural dimension of openness, the gap between high and low gifted countries widens considerably. The role played by active national open science policies might also be a causal factor for the incipient development in some rich countries in the North.

Figure 4

Cartography of repositories by selected countries

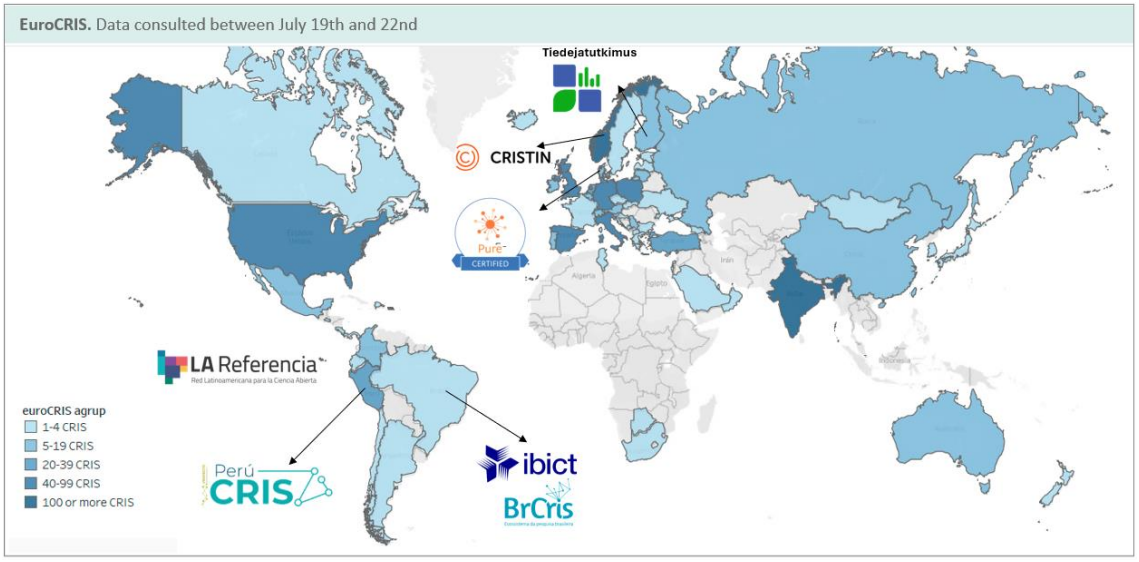


Data Sources: https://v2.sherpa.ac.uk/view/repository_by_country/Argentina.software_name.html; https://www.re3data.org/browse/by-country/ Data extracted 19- 22 de july, 2024.

The open access repositories have to comply with the FAIR principles and the interoperability with other repositories or platforms. They should have persistent identifiers for all digital objects, persons, projects or organizations involved in any given output. But this is not normally the case because repositories can be, and frequently are, separated from national or institutional systems that manage the information on people, projects and funding. The curricular databases and the funding agencies management systems usually are found separately and even in different ministries. The Current Research Information Systems (CRIS) or Research Information Management (RIM) where born precisely to integrate all the information related to research projects and funding (De Castro, 2019). The CRIS systems evolved in Europe since the 1990s and EuroCRIS was created in 2002 with the aim to achieve a good synergic between information managers and librarians. Figure 5 shows that the CRIS systems proliferate mainly in Europe, the US and India, while it is scarcely developed in the rest of the world. The architecture of the different CRIS in Europe ranges from open software (DSpace) up to the commercial versions of Pure (Elsevier) and others.

Figure 5

Cartography of CRIS by country



Data sources: https://dspacecris.eurocris.org/cris/explore/dris, extracted July 19- 22, 2024.

The CRIS systems were developed in Europe and the US at the level of the institutions, in contrast with Latin America where the CRIS systems are more exceptional, but where it has succeeded it was organized at the national scale. In Figure 4 we can see the case of CRIS Brazil and CRIS Perú. In previous studies (Beigel, 2022) we have analyzed the advantages of the national information systems in these two countries and the different path adopted by Argentina, where a national repository system was created under the focus of federated infrastructures. LA Referencia https://www.lareferencia.info/es/ is the regional key actor for both alternatives because it has developed local technology in a network supported by 12 national governments that collects more than 5 million documents harvested from 850 institutional repositories.

3. A Cartography of persistent identifiers of digital resources (PIDs): localization and inclusiveness of objects, organizations and researchers

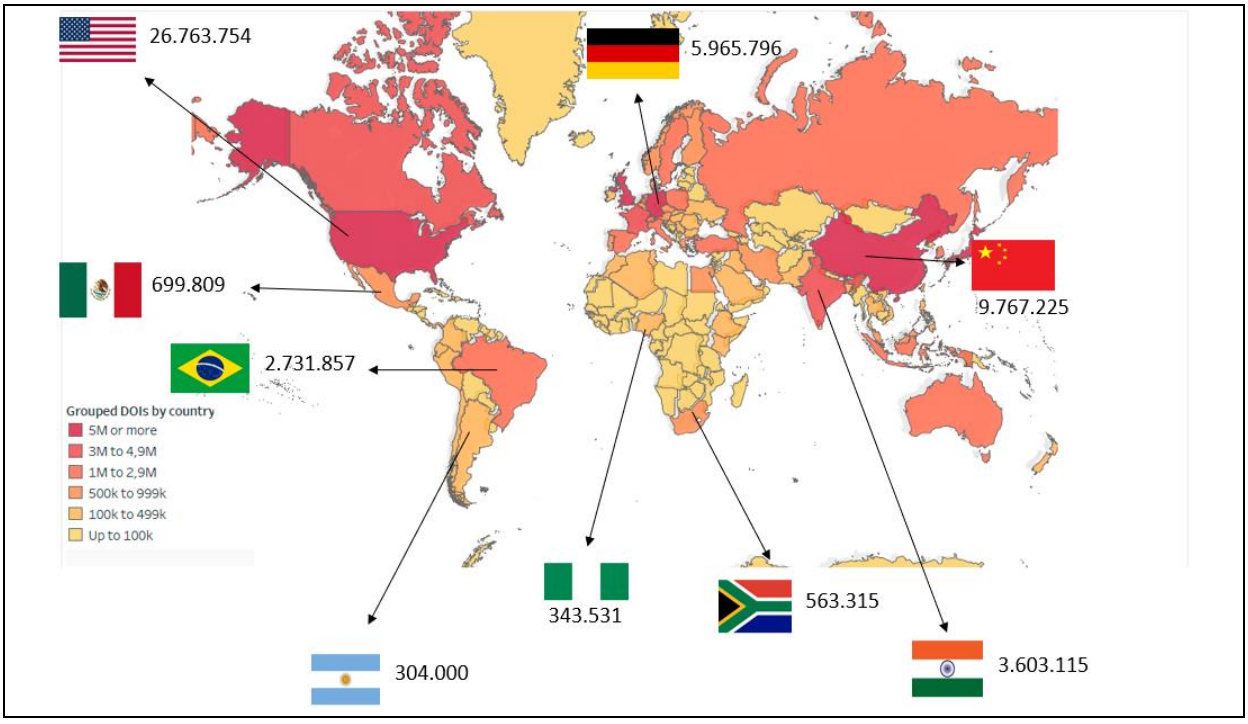
Persistent identifiers are considered the key to the “infrastructure turn” for the advancement of interoperability, but they are also a critical side for data sovereignty and inclusiveness. Okunei & Chan (2023) argue that the study of the circulation of academic knowledge would be incomplete without looking at the underlying socio-technical infrastructures that create the “conditions of possibility” for certification, circulation, access and uptake between the people, the artifacts, and the institutions that generate, share, and maintain specific knowledge about the human and natural worlds. The most renown identifier is the Digital Object Identifier (DOI), a unique alphanumeric string that provides a specific link to content online. Unlike digital resources located by a simple web address -and can often be unstable- each DOI is uniquely attached to an object and its associated metadata.

According to Okunei & Chan (2023) DOI became the dominant PID and is assumed by many to provide a neutral service for scholarly communications. However, it is in fact controlled by some of the most powerful legacy publishers. It was established to better identify the rights holder of an object, especially in a context of exponential digital networks growth and increased digital sharing of online content. In 1998, the International DOI Foundation was formally incorporated to develop and govern the new system, led by a former director at Elsevier and a board compounded by representatives from major companies such as Microsoft, Elsevier and John Wiley and Sons. Thus, this PID helped the big publishers to remain in control and expand their influence in the production and circulation of academic knowledge.

The most widely known application of the DOI system is the Crossref, which is a key piece of the DOI success story. Registered in New York in 2000, Crossref is a citation service which allows a researcher to link from a reference citation directly to the cited content on another publisher's platform, subject to the target publisher's access control practices. A major advantage of DOI for publishers is that it makes the tracking of citations easy for counting and for quantification of usage. Therefore, it leverages and reinforces the deep dependence of researchers on citation as a currency in the academic reward system (Okunei & Chan 2023).

Figure 6

Persistent identifiers of digital resources (PIDs). DOI per country in OpenAlex



Data sources: extracted from OpenAlex API on August 09, 2024

Beyond the centralization that DOI stimulates, the fact that each DOI costs USD1,00 is a driver for exclusiveness, as we can see in Figure 6 highlighting the Southern countries with less than 100.000 DOI. At first sight, one dollar is not a substantial amount, but considering that a medium size public university in Latin America or Africa may be regularly publishing 100 journals per year,

the expenditure is not insignificant. Moreover, to complete identifiers for all the collections that lack these can become an inviable sum. According to the information provided by DOAJ, 54% of the journals edited in Latin America don't have any persistent identifier for digital objects (Authier 2023).

Table 1

Latin American journals with/without PID, in selected countries

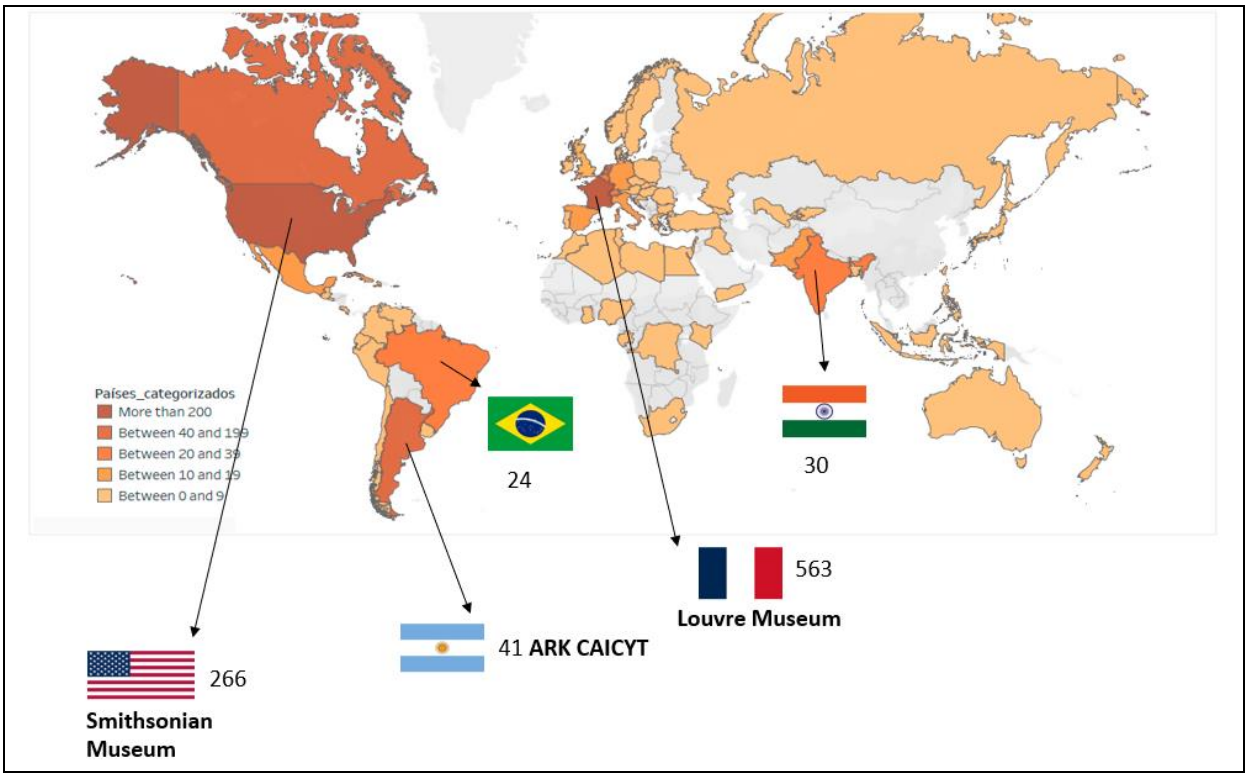
Country	Total journals in DOAJ	with PID	No PID	% no PID
Argentina	383	90	293	**76,5%**
Brasil	1615	836	779	**48%**
Chile	147	72	75	**51%**
Colombia	418	214	204	**49%**
México	199	97	102	**51,3%**

Source: Authier 2023

Even though DOI is the most extended PID, it is not the only persistent identifier: there are hundreds currently at a global scale. Archival Resource Keys (ARK) and HANDLE are among the most relevant, along with DOI, in terms of antiqueness and accumulation of digital objects identified. According to its official site, ARK was created in 2001, and it is integrated by national libraries, universities, archives, museums, governmental agencies and journals. The ARK Alliance is an open global community supporting the ARK infrastructure on behalf of end users, especially researchers, to rely on long term access to the global scientific and cultural record. Around 8.2 billion ARKs have been created by over 1250 organizations. ARKs are open, non-paywalled, persistent identifiers that are administrated in a decentralized infrastructure.

Figure 7

ARK institutions per country



Data sources: ARK official webpage, on August 07, 2024.

To compare Ark and DOI is not currently possible because the available info for the first are organizations and, for the DOI, the total objects identified. But if we compare the accumulation of capacities in both cartographies, in Figure 7 we see 2 Northern poles of organizations (the US and France) and 3 southern poles delivering ARK identifiers (India, Brazil and Argentina). In, contrast, in Figure 6 the distribution of DOI by country in Open Alex shows India and Brazil reaching circa 3.000.000 DOI each. More powerful countries with less population exhibit double, triple or 8 times these digital objects. As suggested in Figure 6 and Table 1, the case of Argentina strikingly levels down with 403.000 DOIs, a weak collection given its importance as a peripheral scientific center in the region. This is why the national publishing Center CAICYT projected an alternative project fostering ARK identifiers for journals https://www.caicyt-conicet.gob.ar/comcient/ark%3A/16680081/rsccgr. This remains, however, a contested issue among many journal editors that consider ARK as not a solution and are demanding funds to establish DOI and participate in the Crossref services.

Related to ARK, a few years ago emerged the *dARK exploratory project*, a technology that aims to be the base for a low cost and decentralized service to assign/resolve persistent identifiers (ARK-PID for this first version) based on institutional blockchain nodes. dARK principles include that the data is owned, stored and controlled by all participants in a public good network. It is an open and community driven project fostered by Instituto Brasileiro de Informação em Ciência e Tecnologia (IBICT Brazil) and LA Referencia RedCLARA (supported by SCOSS) with the long term objective of

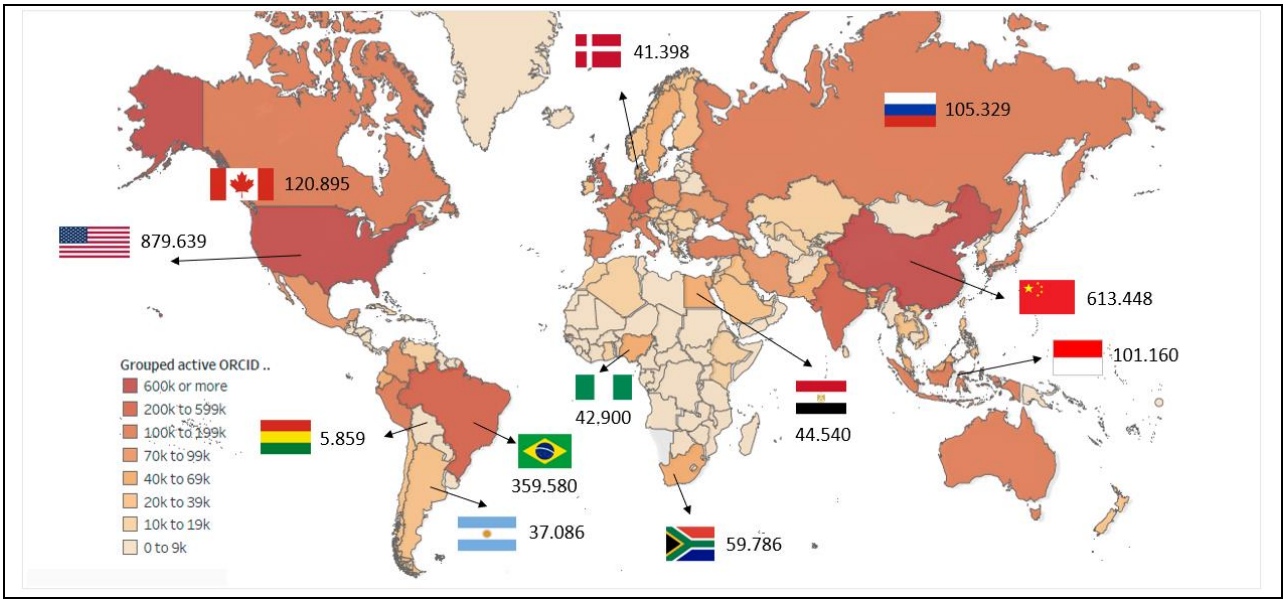
provide a non-centralized persistent identifier factory and resolution service model for the global Open Science ecosystem based on permissioned blockchain technology https://www.Hyperledger.org/use/besu; https://25.scielo.org/es/seminarios/la-referencia/. According with this initiative, the transparent and auditable nature of blockchain enables the tracking and verification of all activities, enhancing transparency and accountability, adding a new layer of trust to the PID ecosystem by allowing the community to check all the transaction history. dARK is currently evolving to phase 3: Integration with External Systems. Phase 4 is a pilot Implementation in Brazil to set up and configure the infrastructure. An ambitious initiative interesting to follow up.

If we delve now in the realm of author and organizations identifiers, an analysis of inclusiveness turns even more difficult, because of the features of the two most known identifiers: *Open Researcher & Contributor ID* (ORCID) and *Research Organization Registry* (ROR). Starting with ORCID, it was launched in 2012 with the aim of a more fundamental solution to the problem of name ambiguity, identifying individual researchers' outputs in a unique registry to manage their records and information. Bello & Galindo-Rueda (2020) highlight the very marked use of ORCID within Higher Education and within Government (about 75%), while adoption is significantly lower among scientific authors within business (55%). Over the years ORCID has become a useful source for studying academic activities reported by researchers (Sixto-Costoya, Robinson-Garcia, Leeuwen van & Costas 2021). International literature has been generally positive towards this new piece of research infrastructure, although some commentators have highlighted negative issues or resistances to in the research community as well as the way in which they are increasing mandated by publishers, funders, and even employers.

However, the main issue that affects ORCID as a source for science studies and particularly to comprehend inclusive openness is the fact that is designed to identify "active researchers", but there is no control on the compliance with this definition. There is a substantial share of researchers replicated, because it can be listed by the individual, the institutions in which the person is affiliated or by any web user for other purposes. Baglioni, Manghi, Mannocci, & Bardi (2022) documented the existence of fake orcid records created via AI techniques with commercial purposes, non-existing orcid IDs, wrongly attributed ORCID iDs, among other misapplications. We compared the ORCID database by country with other statistical data related to the full-time researchers, such as the Full-time equivalent (FTE) of research and experimental development personnel in R&D (UNESCO, 2020) https://uis.unesco.org/sites/default/files/documents/fs61-human-resources-rd-2020-en.pdf and the Researchers full-time equivalent as defined by RICYT (2023) https://www.ricyt.org/wp-content/uploads/2023/12/EL-ESTADO-DE-LA-CIENCIA-2023.pdf We found no pertinent correlations with the orcid registry to compare the workforce of a given country or create a rate of the share identified by this digital infrastructure. Many countries, for example, had double or triple ORCIDs of their total R&D personnel.

FIGURE 8

ORCID Active researchers by country

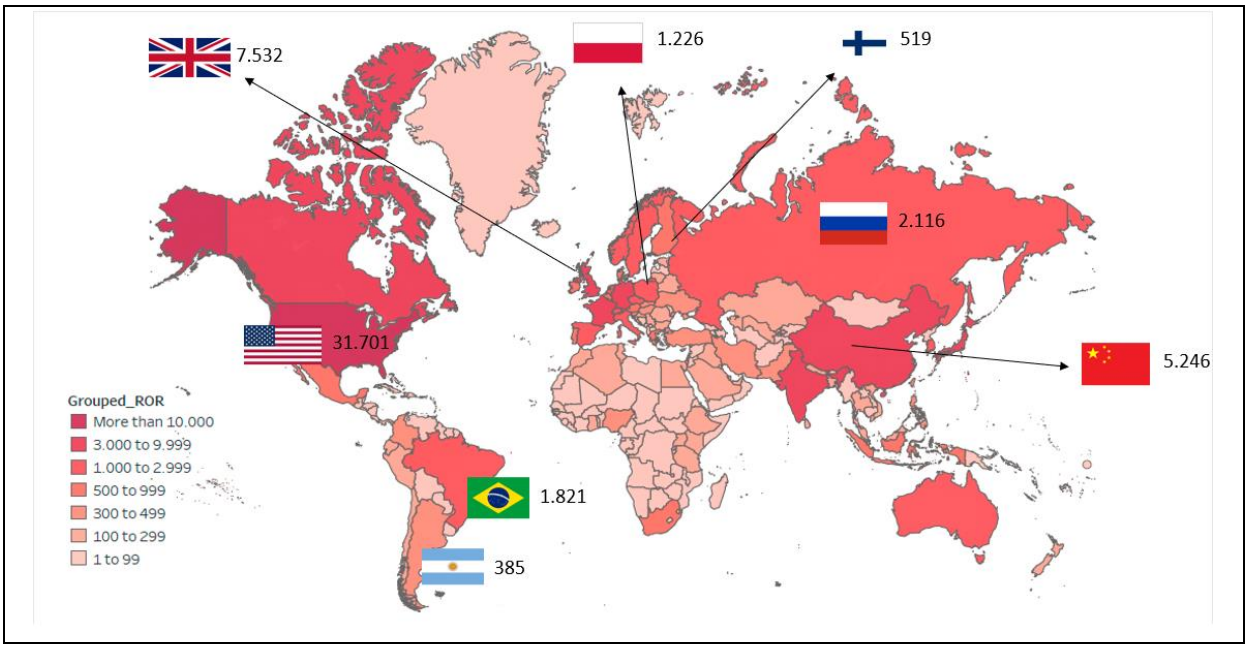


Data sources: ORCID official statistics webpage, on August 08, 2024.

Figure 8 shows general asymmetries comparing the population size and the orcid registered in each country which broadens the gap in terms of visibility and circulation of the published output. Even if there is no individual cost for ORCID as in the case of DOI, inclusiveness cannot be taken for granted since this persistent identifier means digital capacities, institutional resources and policy incentives. But a more consistent proxy for this PID's inclusiveness is not possible in the current state of this infrastructure.

On its part, the *Research Organization Registry* (ROR) is defined in its official site as a global, community-led registry of open persistent identifiers for research organizations https://ror.org/ In Figure 9 we see that it is also difficult to build an inclusiveness indicator for this identifier because there is no pattern to compare for example an international census of scientific organizations. Although it is noticeable that great part of the African countries has less than 100 organizations in the registry. Furthermore, ROR includes diverse types of organizations and coverage varies greatly by type of organization, as can be seen in Table 2.

Figure 9
ROR by country



Data sources: ROR API, extracted August 08, 2024.

Table 2
ROR by type of organization, selected countries

Country	Education	Facility	Healthcare	Funder	Nonprofit	Government	Company	Other	Archive
Argentina	114	114	57	56	36	35	15	10	5
France	2131	1032	414	414	359	313	216	182	33
South Africa	58	54	43	16	9	4	4	3	2
U. Kingdom	2628	1410	1349	1140	711	562	332	305	236
United States	9703	7157	5929	4307	3986	2342	1723	1362	1233

Data sources: ROR API, extracted August 08, 2024.

We took one national example based on the available national registry of research and teaching organizations for Argentina, a database called SIGEO, and the share of organizations with this international persistent identifier is very small (See Table 3). This has some negative consequences for Argentina in terms of international funding applications, visibility in global research networks, citation services and other competitive domains.

Table 3

Argentina's research organizations in SIGEO and ROR

SIGEO			ROR		
Organization	**Quantity**	**%**	**Organization**	**Quantity**	**%**
Government science and technology agency	16	0,6%	Government	35	7,9%
Government administrative entity	332	12,4%	Facility	114	25,8%
State university or university institute	81	3,0%	Education	114	25,8%
Private university or college	76	2,8%			
Non-university educational institutions	631	23,6%			
Company	837	31,3%	Funder	56	12,7%
			Company	15	3,4%
Non-profit entity	521	19,5%	Nonprofit	36	8,1%
Health care institution	183	6,8%	Healthcare	57	12,9%
			Other	10	2,3%
			Archive	5	1,1%
Total	**2.677**	**100,0%**	**Total**	**442**	**100,0%**

Data sources: ROR API, extracted on August 08, 2024; SIGEO system provided to the author by request to CONICET-SIGEVA on September 05, 2024.

In all these country-level comparisons it is always necessary to reiterate that there are persistent intra-national asymmetries that are the result of the structural heterogeneity of the academic fields. In the example of Argentina, this is particularly clear in the concentration of material and symbolic resources in the capital city and the institutions located in this national hub which have a direct incidence in the institutional capacities to assign PIDs for digital objects, persons and organizations (Beigel, Gallardo & Bekerman, 2018).

4. Openness and inclusiveness in scholarly publishing: the tension between the "gold" and the "diamond"

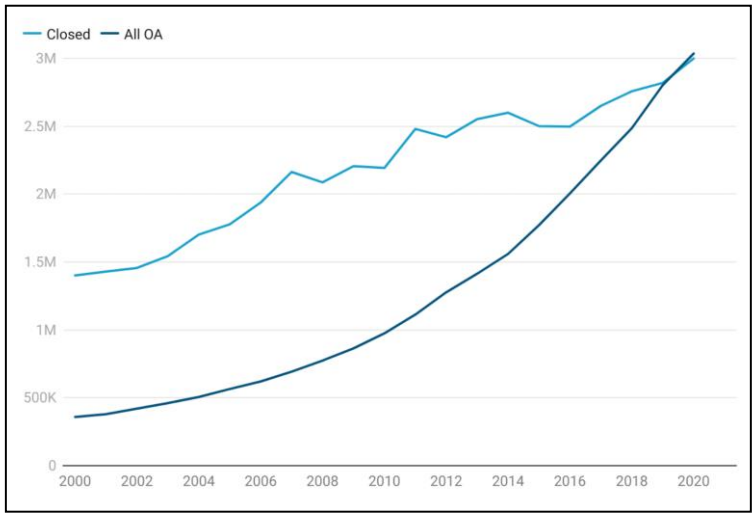
The current tensions existing in open access publishing give enough evidence of how and when openness can be featured by exclusiveness, two dimensions that seem opposite in nature. It has been extensively discussed that the development of the gold route by commercial publishers led to increasing openness to readers but a new paywall for authors by transferring the costs of publication through the "article processing charges" (APCs). The big scholarly publishers not only recur to price authors from low-and-middle income countries for increasing revenues, but the dominant strategy is also to convene millionaire read & publish agreements with universities and funding institutions (Debat & Babini 2019; Becerril et al. 2021; Bosman et al. 2021; Khanna et al. 2022; Simard et al. 2022; Simard et al. 2023). Pinfield (2025) argues that OA is fast becoming part of the mainstream because there are several commercial strategies to dig in this profitable market. But the common denominator that they all share the lack transparency of costs and APC prices. Pagliari has pointed out that universities and funders are increasingly worried about paying

thrice for the full process of research and its dissemination: once as salary support for researchers; once to buy journal subscriptions; and once to subsidize APCs charged by OA publications, where these are not fully covered by granting agencies (Pagliari, 2015).

The colleagues in the project *Transform2Open* https://doi.org/10.48440/os.helmholtz.054, show that APC costs in Germany are often not visible because universities or funding agencies negotiate with the big publishers and, accordingly, it is not perceived as an individual problem.In contrast, for researchers from low-and-middle income countries, open access fees are mainly an individual problem, resolved with personal funds or subsidies given the lack of institutional agreements with the big publishers. Facing these structural constraints many productive researchers are not compliant with OA principles, preferring instead to continue with the model of subscription-funded journals, besides spending a lot of time searching for quality journals with no fees to disseminate their work. In many Southern countries national funding agencies and universities have not advanced incentives for open access publishing because they cannot subsidize APCs and less can these institutions afford transformative agreements. As can be seen in Figure 10 open access is steadily growing, and is broadly celebrated, but the still growing trend of closed access is scarcely observed.

Figure 10

Trends of open access and closed access to scientific publications in the period 2000-2020.



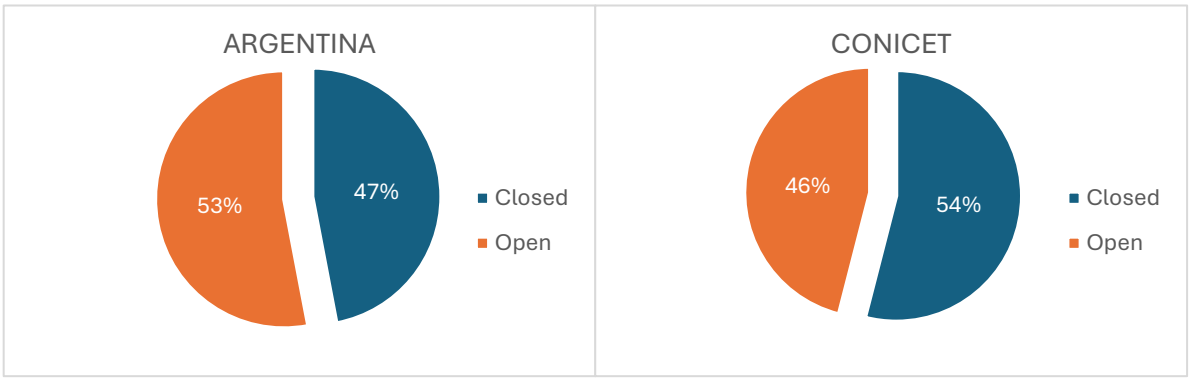
Data Sources: https://www.dimensions.ai/blog/open-access-surpasses-subscription-publication-globally-for-the-first-time/

The issue of transparency behind the scenes of commercial open access is probably fading the fact that more and more researchers choose subscription or hybrid journals, and this factor pushes backwardness in the open access movement. This is why some of the exponents of the BOAI declaration feel that gold open access is a pyrrhic victory for a movement that was born with the idealistic intention to foster gratuitous and immediate access to scientific information through the internet. Our study of the publishing practices and APC costs for Argentina showed that at the level of the country, open access articles were reaching a majority, but when observing the internationalized, most productive elite of the CONICET, the relation between closed and open access was inverted (See Figure 11). In a recent survey on APC practices and perceptions in Latin America and Africa, we observed that researchers from STEM disciplines identified open access

with APC journals and were not aware of the diamond or green route. In addition, other researchers resisted paid open access by ethical or philosophical motives (Beigel & Montoya, 2024; Gallardo, Millia, Appel, APC-GRIP TEAM, Van Schalkwyk, 2024).

Figure 11

Articles by type of access 2013-2020, Argentina all and CONICET (correspondent author)



Data sources: Vélez Cuartas, Beigel et al 2022

Amid this struggle between commercial and non-commercial open access, with the announcement of several new diamond open access (OA) related initiatives, such as the Action Plan for Diamond Open Access, the DIAMAS and CRAFT-OA projects, and the recent creation of the Global Summit on Diamond Open Access, diamond OA seems now at the forefront of the OA movement. Therefore, building a cartography of indexed diamond journals is relevant because these journals are critical players for a change in the publishing practices. However, this mapping is not an easy task. Firstly, because until today, there is no comprehensive global directory of diamond journals. There are several projects attempting to contribute in this direction, such as the European Diamond Capacity Hub (EDCH) led by DIAMAS and CRAFT-OA https://diamasproject.eu/european-diamond-capacity-hub-the-future-of-diamond-oa/. But still the most referenced source is DOAJ, despite the important number of journals that are not indexed in this directory.

Secondly, transparency issues are critical and pose a serious question on the definition of diamond journals. Many journals don't publish their fees, and the information is not available in DOAJ but this doesn´t mean that they are Diamond journals. Others may not have a current fee because of occasional funding but return to a gold business model the following year. Moreover, the publishing market is highly dynamical and many journals that were considered diamond in the DIAMAS LANDSCAPE (Bosman et al 2021) have been sold to commercial publishers and transitioned to gold access in the last few years. Simard, Butler, Alperin & Haustein (2024) noticed that temporarily waiving APCs was a commonly used strategy by the Big 5 for-profit publishers for and this added more instability to the data collected of a given journal.

The Second Diamond Open Access Summit held in Toluca, México (2023) arrived at a consensus on the seven facets of diamond OA; 1) equity, 2) knowledge as a public good, 3) community-driven, 4) diversity, 5) transitioning to diamond, 6) research assessment and recognition, and 7) multi-level cooperation (Saenen et al., 2024). From several research teams there is a pledge for a more accurate way to operationalize diamond OA in quantitative science studies that accurately

reflects these values. Currently, the classification of a journal as “no fee” or “no APC” is used indistinctively but it is better to clarify to avoid misunderstandings. According with the DIAMAS Landscape Report (Armengou et al., 2023) ‘No fee’ publishing models are collectively known as Diamond OA when there are no charges for reading or publishing. When Institutional providers are fully in line with the Diamond model it is considered as the ideal, most equitable, end state of institutional publishing. They coined the term ‘diamondisation’ for journals that are moving towards fully Diamond OA.

Simard, Butler, Alperin & Haustein (2024) propose classifying no-APC journals into at least two categories: 1) non-profit journals that do not charge APCs because their costs of publishing are covered by another source of revenue such as a learned society, and 2), for-profit journals that temporarily do not charge APCs for various reasons (e.g., promotion, the COVID-19 pandemic, agreements with learned societies, etc.). We could say that the first category would approach diamondisation, and the second one would define journals that are inside or entering the realm of commercial open access. However, there is a third type of no APC journals that can be safest to classify as diamond because they approach the Latin American model: journals with no fees for authors nor readers that are edited mainly by universities and managed by centralized portals with institutional resources (Beigel et al 2023; Beigel et al 2024). Open Access in this region is well-established across the region as well as the relatively high investment by the government in research and scholarship. It can be described as a publishing ecosystem featured by an idea of science as a common good and a tradition of “sharing”, with scarce intervention in the activity of the profit-driven publishing industry. The Latin American academic journals are led, owned and financed by academic institutions and it is rare to outsource editorial processes (Becerril-García & Aguado-López 2019).

Several landscape studies have been carried out in recent years including the mentioned Open Access Diamond Journal Study, its dataset with empirical results (Bosman et al., 2021) and recommendations (Becerril et al., 2021). The study reveals that the number of diamond journals can be estimated at 29,000, but only a third of them are registered in DOAJ. Since 2018, they observe that the share of diamond journal articles has been dwindling, which coincides with the increase in articles in APC-based journals. They argue that OA diamond sector is diverse in terms of disciplines (60% SSH, 22% science, 17% medicine) and the share by regions also differs: 45% in Europe, 25% in Latin America, 16% in Asia, 5% in the US/Canada. As we will see below, the share of Latin America is underreported because DOAJ covers only part of this regional landscape. The most recent report by DIAMAS explores Institutional Publishing Service Providers (IPSP), with a special focus on those publishing institutions or companies that do not charge fees to authors or readers.

Evidently, to create a global cartography of diamond journals poses several challenges: incomplete lists and overlaps among indexing services; ambiguous definitions and transparency issues. Our mapping in this paper includes only journals indexed in services that can guarantee the academic quality of the publication, because our final goal is to contribute to the change in publishing and foster good practices in research assessment. But it is relevant to clarify that this leaves aside hundreds of academic journals that may comply with all the quality standards, such as the ones that can be found in hosting platforms such as Open Edition (France) and Érudit

(Canada). Also, in Latin America hundreds of non-indexed journals have been considered in broader mappings (Salatino, 2017).

So, to create an aggregated dataset, we started with DOAJ, harvesting all journals by 31/07/2024, a total of 20.732, and selecting no-fee journals, a total 13.352 as can be seen in Table 5. This base-list was compared with several lists using computational language R and crossing ISSN and title. The first aggregation was made with our own empirical research on the Latin American circuit in the frame of the Project OLIVA[4]. Our database includes 4.077 open access journals indexed by SciELO, Redalyc, Biblat or Latindex, without overlaps, being the great majority classified as diamond (Beigel et al 2024). Another survey with a focus in Argentina was made recently[5]. The comparison resulted in 1,626 new journals (See Table 5). OLIVA built a database for journals indexed and published in Latin America (Oliva 1.0) and a second database including journals from Portugal and Spain (Oliva 2.0) [6]. Given the fact that Latindex has a particular incidence in the journals edited in Spain and Portugal, and a relevant part is not listed in DOAJ, we downloaded the available complete list of Latindex Catálogo 2.0 by 02/08/2024 and 331 new journals were added to the dataset[7].

Table 5

Aggregated list of No-fee Journals, n=15,841

SOURCES	JOURNALS
OPERAS-DOAJ	13,352
OLIVA AMLAT	1,626
Scielo South Africa	14
RedALyC África	0
Sherpa Romeo Africa	228
AJOL	57
Latindex (Spain and Portugal)	331
OLIVA ARG	121
EIFL Landscape Africa 2024	112
TOTAL	**15,841**

Data sources: DOAJ 31/07/2024 – OLIVA AMLAT 01/10/2023 & ARGENTINA 07/08/2024 – SCIELO 01/08/2024 – REDALYC 01/08/2024 – Sherpa Romeo (África) 02/08/2024 – AJOL 01/08/2024 – Latindex 02/08/2024– EIFL list 14/08/2024 (Kuchma and Ševkušić 2024).
Note: 202 journals were excluded since these were marked as APC journals by Butler et al.

To complete the list of no-fee open access publishing in Africa we first accessed the AJOL list by 01/08/2024 and added 57 journals. The same procedure was applied in Sherpa Romeo by web scrapping through R on 02/08/2024: 228 new no-fee journals based in Algeria, Angola, Cameroon, Côte d'Ivoire, Egypt, Ghana, Kenya, Mauritius, Morocco, Nigeria, South Africa, Tunisia and Zambia were added.

[4] https://cecic.fcp.uncuyo.edu.ar/oliva/
[5] I thank Maximiliano Salatino for revising the list by 07/08/2024.
[6] The datasets of OLIVA can be accessed in the Data Repository of CONICET https://ri.conicet.gov.ar/handle/11336/175850
[7] I thank Octavio Alonso Gamboa for his help in revising this list and the new journals added to the list.

Figure 12

Cartography of indexed journals with no-fee for publishing or reading, n=15.841

Data sources: DOAJ – OLIVA AMLAT & ARGENTINA – SCIELO – REDALYC – Sherpa Romeo (África) – AJOL – Latindex – EIFL Kuchma and Ševkušić (2024). Note: 202 journals were excluded since these were marked as APC journals by Butler et al.

Next, we contacted the authors of the study performed by EIFL, with the collaboration of AJOL (African Journals Online) and WACREN (the West and Central African Research and Education Network), supported by Wellcome. The study provides an overview of open access (OA) journals in Africa that do not charge fees for either authors or readers. It is based on survey responses from 199 journals, 21 institutional, national and continental platforms that host Diamond OA journals, and 25 country reports with information about current funding and financial sustainability approaches and challenges, institutional in-kind support, incentives and collaborations among journals. The study highlights the editorial quality of African Diamond OA journals and their peer review workflows, technical services efficiency, and visibility and discoverability (Kuchma & Ševkušić 2024). The list of journals from this project was accessed by 14/08/2024 and it brought 112 new journals to add to our list[8]. Finally, by 02/08/2024 we explored the collection SciELO South Africa which reported 14 new no-fee journals and REDALYC Africa with only 2 journals from Angola that had already been identified in other lists.

[8] I thank Iryna Kuchma and Milica Ševkušić for sharing the list and for our discussions.

Table 6

Top 20 No fee journals by countries

Indexed diamond journals by country		
	Country of publisher	**n**
	Brazil	1912
	Indonesia	1316
	Spain	1228
	Argentina	717
	Poland	683
	Colombia	612
	United States	612
	Iran	558
	Russian Federation	549
	Türkiye	463
	Italy	461
	México	407
	United Kingdom	405
	Romania	320
	France	291
	Chili	276
	Germany	255
	Ukraine	253
	Perú	238
	India	237

Data sources: DOAJ – OLIVA AMLAT & ARGENTINA – SCIELO – REDALYC – Sherpa Romeo (África) – AJOL – Latindex (España y Portugal) – EIFL Kuchma and Ševkušić (2024).

Table 6 shows the top 20 countries editing no fee indexed journals. Brazil, Indonesia and Spain are in the first positions, followed by Argentina[9] and Colombia. Analyzed by region, Figure 12 shows this regional share: 31,1% edited in Latin America, 21,5% in Western Europe, 13,9% in Eastern Europe, 3,9% in Africa, 15,5% in Asia and 5% in North America.

5. A Cartography of Multilingualism: indicators of coverage and linguistic inclusiveness in Publishing Platforms

Numerous studies have established that WoS and Scopus underrepresent certain disciplines and regions of the world, with a systematic linguistic bias towards English (Archambault et al., 2006; Basson et al. 2022; Sivertsen, Kulckinski et al 2020). However, the prominence of these two scholarly indexing services did not diminish because these journal collections provided the basis to establish the quality of a publication and the standard indicators for the national output in scientific reports as well as for university rankings and research assessment. Eventually, their continued use over such an extended period for research assessment and scientometrics has perpetuated their use (Tennant 2020; Alperin, Portenoy, Demes, Larivière & Haustein 2024). The debate on publishing data sources not only revolves around language but also around the coverage of the SSH, the quality of citations, the uses and abuses of the Impact Factor for gaming the metrics, along with other transparency issues (Siler & Larivière, 2022; Biagioli et al 2019).

[9] The number of indexed no-fee journals in Argentina were provided by our own empirical survey made in October 2023 and revised in 07/08/2024, but the rest of the countries of Latin America may have increased their number of journals also.

In recent years, new global bibliographic services and search engines have provided new opportunities to explore scientific production beyond WoS and Scopus: Dimensions, Lens, CrossRef, Google Scholar, SciELO, Redalyc, LA REFERENCIA, DOAJ, Open Alex, among others. Our own explorations in a comparative study of the coverage and circulation of the output by the researchers at CONICET (Argentina) and CNPq (Brazil) evidenced a much broader landscape for all disciplines in Google Scholar (Beigel et al 2023). Undoubtedly, the fact that Google Scholar covers a greater share of the social sciences and humanities fosters its increasing use as a bibliometric data source -such as the case of Qualis in Brazil- but its commercial nature creates constant obstacles to advance in this direction (Digiampietri, Gallardo, Baranger & Beigel, 2024).

Open Alex is particularly promising in this debate. In a study conducted in collaboration with the OpenAlex team its coverage has been addressed by comparing it with Scopus across several dimensions (Alperin, Portenoy, Demes, Larivière & Haustein 2024). The analysis concludes that OpenAlex is a "superset" of Scopus because high rank correlations were found, although it can be a reliable alternative for some analyses, particularly at the country level. Interestingly, the lowest correlations were found for the number of works per language. They notice that both databases use different approaches to determining the language of a given work, and no published work to date has examined the quality of the language detection in OpenAlex. But, for a limited set of analyses, Alperin, Portenoy, Demes, Larivière & Haustein (2024) argue it can already be used as a replacement for traditional bibliographic databases. Table 7 shows the number of articles by language and the comparison in terms of the share of English shows an interesting multilingual trend in OpenAlex. However, the numbers observed for Spanish and Portuguese in OpenAlex, comparing with the regional platforms in Table 8 prevent us that deeper technical approaches are needed to discard replications or the incidence of the languages in abstracts.

Table 7

Language coverage in Scopus, WoS and OpenAlex, complete collections (main text)[10]

LANGUAGE	Scopus		WEB OF SCIENCE		OpenAlex	
Spanish	772.266	1,12%	214.426	0,50%	4.107.230	2,79%
Portuguese	310.751	0,45%	85.988	0,20%	1.996.116	1,35%
English	58.445.681	85,11%	40.443.321	94,72%	107.635.529	73,02%
French	1.188.476	1,73%	485.083	1,14%	3.248.801	2,20%
Other languages	7.954.663	11,58%	1.469.958	3,44%	30.412.370	20,63%
Total	**68.671.837**	**100,00%**	**42.698.776**	**100,00%**	**147.400.046**	**100,00%**

Data sources: extracted from SCOPUS (30-8-2024); WoS (06-09-2024); OPENALEX (09-08-2024). Note: the query for OpenAlexR (R package for OpenAlex API) was organized as follows: list(entity = "works", type = "article", primary_location.source.type = "journal", language = "en")

[10] WoS and Scopus were extracted for us by generous colleagues abroad, because Argentina doesn't have access to these subscriptions. Special thanks to Juan Pablo Alperin and Diego Kolzowski. We also thank Rodrigo Costas-Comesaña and Alysson Fernandes Mazoni for their guidance in the language query in OpenAlex.

Interesting results are found in the exploration of the Latin American publishing platforms and repositories. SciELO, Redalyc, Latindex, Biblat and the Iberoamerican repositories, LA Referencia, cover a broad landscape of intercultural production, providing a space for the communication of scientific results in Spanish and Portuguese. As we already mentioned, the persistent problem is the lack of interoperability among these services, which creates a relevant overlap that results from the fact that the Latin American journals are frequently indexed in at least two regional platforms. Table 8 shows that Latindex is the most prominent source for articles in Spanish[11] while LA Referencia is the main source for articles in Portuguese. However, the major contribution of this federation of repositories can be found in the PhD and master's dissertations collection which is not included in the comparison.

The language share in the SciELO collection is striking, because English papers have surpassed the number of Portuguese articles. This trend is mainly pushed by the Brazil Collection with a progressive adoption of English as the sole language or simultaneously with Portuguese, while the other national collections preserve a dominant role of Spanish. SciELO is the only regional platform that applied concrete actions towards publishing in English and as a result journals with more than 50% of articles in English increased from 28% in 2003 to 62% in 2022. Packer (2024) argues that this is part of the vision that SciELO had since its foundation with the aim of maximizing the visibility and impact of the journals.

Table 8

Language coverage in Scielo, RedALyC, Biblat, LAReferencia and Latindex, complete collections (main text)[12]

LANGUAGE	SciELO		redalyc		biblat		LA Referencia		latindex	
Spanish	364.262	36,60%	403.153	58,28%	380.759	53,10%	663.452	30,50%	679.384	85,00%
Portuguese	339.389	34,10%	177.022	25,59%	146.107	20,40%	898.721	41,30%	40.339	5,00%
English	354.130	35,50%	105.409	15,24%	100.492	14,00%	639.313	29,30%	65.588	8,20%
French	1.062	0,11%	2.005	0,29%	772	0,10%	3.628	0,20%	1.648	0,20%
Other languages	2722	0,30%	4.202	0,61%	88314	12,30%	14.709	0,70%	12541	1,60%
Total	**996.304**	**106,61%**	**691.791**	**100,00%**	**716.444**	**100,00%**	**2.178.460**	**101,90%**	**799.500**	**100,00%**

Data sources: SCIELO (05-08-2024); Redalyc (09-09-2024); BIBLAT TOTAL (25-07-2024); LA REFERENCIA (24-07-2024); LATINDEX (06-08-2024).

[11] Latindex is a directory of journals that are evaluated on a set of selective criteria to be included in the Catalogue 2.0. Is portal has been historically dedicated to providing data only at the level of the journal. Recently, a search engine for articles has been launched: https://latindex.org/latindex/Solr/Busqueda?idModBus=3&buscar=&submit=Buscar

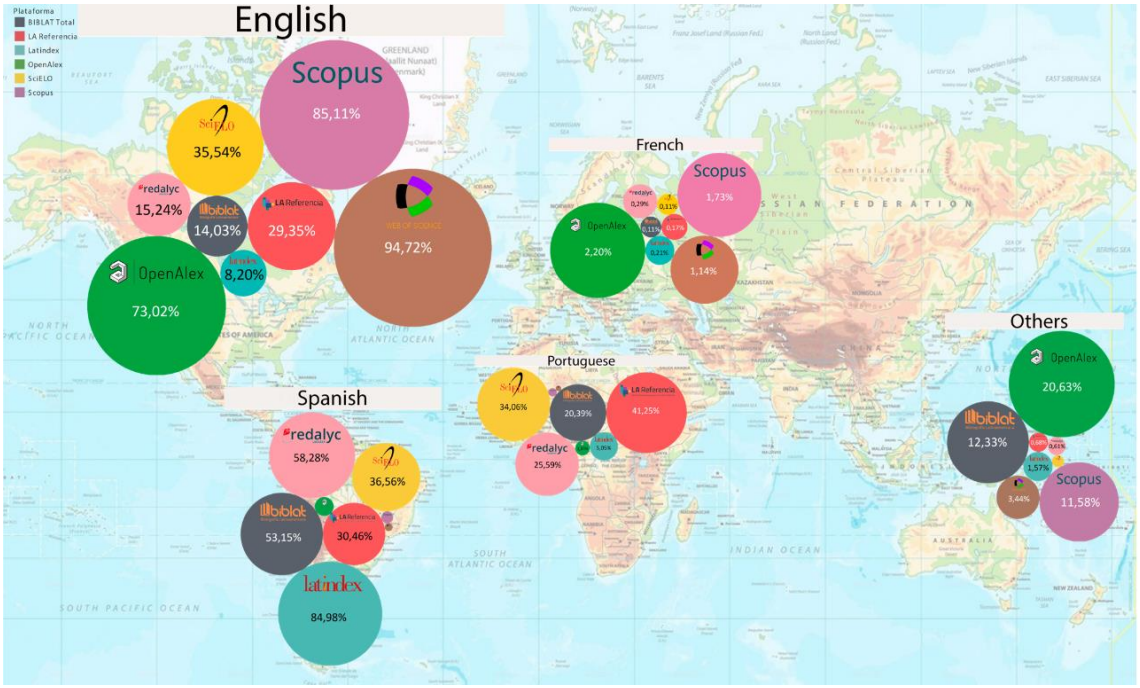
[12] Special thanks to the colleagues who generously verified and discussed with us the data: Abel L. Packer for SciELO; Antonio Sánchez Pereyra for BIBLAT; Lautaro Matas for LA REFERENCIA; Octavio Alonso Gamboa for Latindex.

This rises a concern about the negative impact of this trend in the development of the ability of the Portuguese to participate in the state of the art in scientific knowledge and the circulation of the different national and local communities that speak this language in Europe, Africa and Latin America. On the other hand, it might be questioned to what extent the adoption of English is a guarantee for a greater impact in the global North or towards increasing internationalization, given the fact that it has been proven that national publishing is a steady trend in Brazil for all disciplines (Beigel and Digiampietri 2023).

Figure 13 shows the complete language shares among publishing platforms. We didn't include other platforms to avoid accumulating overlaps among the publishing platforms, but it is interesting to note that a recent study shows that of the total journals listed in DOAJ 65% (11,331) publish only in one language, and 35% (6,234) publish in two, three, and up to 16 languages (Del Rio & Lujano, 2024).

Figure 13

Cartography of multilingualism in scholarly publishing, by platform



Data sources: SCOPUS (30-8-2024); OPENALEX (09-08-2024); WoS (06-09-2024); SCIELO (05-08-2024); BIBLAT TOTAL (25-07-2024); LA REFERENCIA (24-07-2024); LATINDEX (06-08-2024); Redalyc (09-09-2024)

Evidently, English is still the dominant language. As Müller de Oliveira et al (2024) argue, there is an active relationship between multilingualism and policies for the promotion of linguistic

repertoires. And this is a critical asset for an inclusive, intercultural open science. On the other hand, policy incentives for multilingual practices through translation do not always have to include English. For example, it could be efficient in Ibero-America to foster journals with simultaneous publications in Portuguese and Spanish as a mean to increase regional impact and circulation within the region, aiming to expand an existing and dynamical community of readers that is often disregarded.

6. Case studies of inclusiveness and openness: coverage and visibility In Brazil, Argentina and Uruguay

For more than thirty years I have been exploring the Latin American publishing circuit and the regional data sources such as Redalyc, Biblat, Scielo and Latindex, along with national databases such as LATTES (Brazil), SIGEVA (Argentina) and CVuy (Uruguay). Broadly, it can be said that these regional and national databases cover a much diverse scientific production, creating alternative circuits for multi-scale research agendas, providing a space for the communication of scientific results that can be invisible in global databases but socially relevant for local or national communities. The exploratory studies on the complete production corpus extracted from curricular national databases is a relevant path for seizing a broader landscape of the scientific output of a given country. Although, these self-loading curricular systems must be revised and controlled with other databases and national repositories, especially the records without DOI or another permanent identifier. In the frame of this comparative project, we explored two national curriculum databases from the researchers at the National Council for Scientific and Technological Development (CNPq) and the National Scientific and Technical Research Council (CONICET): the Brazilian Lattes and Argentina's SIGEVA. While Lattes is public and is the unique database for curriculum in Brazil, SIGEVA is not public (only available for research studies on formal demand) and it is not the only curriculum database in the country. The other one is called CVar but it is not updated nor offers a view of the metadata of each publication. The research output of the CONICET researchers harvested in this comparative project amounts to 81,005 articles and the CNPq researchers to 464,361. Table 9 shows the total number of articles corresponding to researchers in each area, and the proportion of them identified by DOI. As we can see, the output without DOI is significant, especially in the SSH for both countries.

Table 9
Number of articles and percentage having DOIs by discipline and country, 2013-2020.
CNPq-Brazil N=464,361; CONICET-Argentina N=81,005.

Scientific area	CNPq Brazil		CONICET Argentina	
	Articles	% DOI	Articles	% DOI
Biological and Health Sciences	183,210	86%	26,529	91%
Natural and Exact Sciences	94,370	90%	22,617	93%

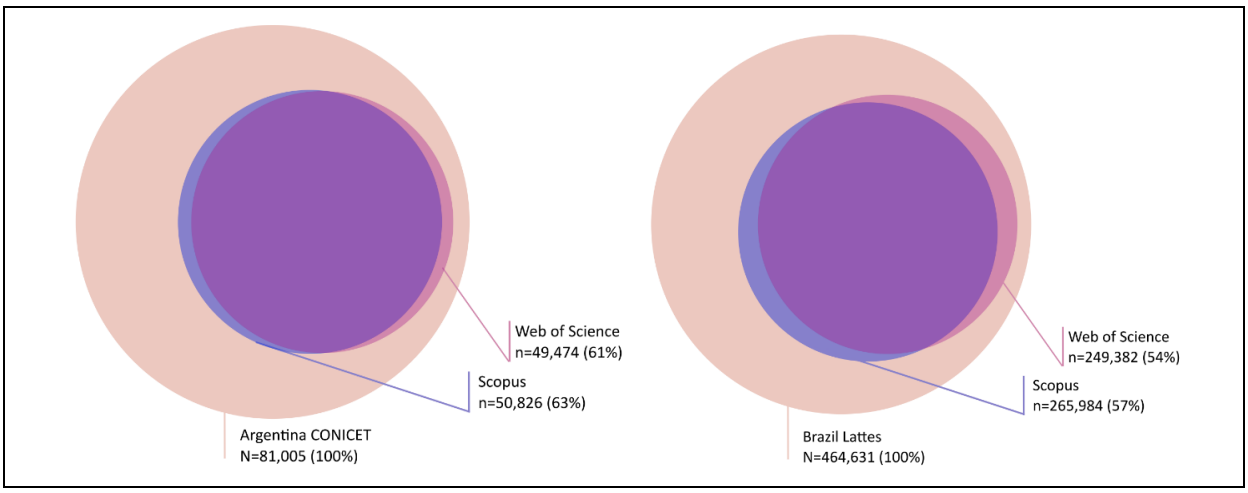
Agriculture Sciences and Engineering	134,346	81%	23,032	87%
Social Sciences and Humanities	76,637	45%	22,228	46%
Total	*464,361*	*78%*	*81,005*	*78%*

Data Sources: Digiampietri, L. Gallardo, O. Baranger, D. y Beigel, F. (2024) Approaching bibliometrics and prosopography: a comparative study of publishing performance by CNPq (Brazil) and CONICET (Argentina) https://doi.org/10.1590/SciELOPreprints.10128

There is a correlation between this portion of output without DOI and the coverage in global databases. Figure 14 shows that the portion covered by WoS and Scopus is very similar and there is a portion of the total production uncovered that ranges from 34% for CONICET and 39% for CNPq.

Figure 14

CONICET-Argentina and CNPQ-Brazil articles: Web of Science and Scopus coverage. CNPq-Brazil N=464,361; CONICET-Argentina N=81,005.



Data Sources: Digiampietri, L. Gallardo, O. Baranger, D. y Beigel, F. (2024) Approaching bibliometrics and prosopography: a comparative study of publishing performance by CNPq (Brazil) and CONICET (Argentina) https://doi.org/10.1590/SciELOPreprints.10128

The inclusiveness of this production in OpenAlex is also limited by the possession of DOIs for each document. The comparison between the output harvested by our team in the curriculum systems of Uruguay, Argentina and Brazil evidenced this structural constraint that affects differently according with the scientific policies and the institutional support developed in each country. In Table 10 we can see that the share of articles with DOI is similar in Brazil and Argentina, while in Uruguay only half of the articles included in the national curriculum system are found in OpenAlex.

Table 10

National research bodies (Argentina-Brazil-Uruguay), coverage in OPENALEX

NATIONAL RESEARCH AGENCY	TOTAL ARTICLES IN CV DATABASES 2013-2020	Unique records with DOI	% with DOI	Records found in Open Alex	% in Open Alex
BRASIL-CNPQ	(LATTES) 464,361	345,748	74,5%	342,049	73,7%
ARGENTINA-CONICET	(SIGEVA) 81,005	63,184	78,0%	63,030	77,8%
URUGUAY-SNI	(CV Uy) 17,855	8,826	49,4%	8,757	49,0%

Data sources: For BRAZIL-CNPQ and ARGENTINA-CONICET Digiampietri, L. Gallardo, O. Baranger, D. y Beigel, F. (2024)[13]; For URUGUAY-SNI data extracted from CvUy on January 5, 2024[14]

Table 11

Researchers from CONICET, CNPQ and SNI identified in OPENALEX

NATIONAL RESEARCH AGENCY	TOTAL RESEARCHERS	% IDENTIFIED VIA ORCID	% IDENTIFIED VIA DOI	% IDENTIFIED BY NAME (MANUAL CHECK)	% UNIDENTIFIED	Total
BRASIL-CNPQ	14,814 (2020)	43,90%	35,68%	6,64%	13,78%	100%
ARGENTINA-CONICET	10,619 (2020)	0%	49,24%	7,33%	43,43%	100%
URUGUAY-SNI	2,117 (2023)	48%	5%	29%	17%	100%

Data sources: For BRAZIL-CNPQ and ARGENTINA-CONICET: Digiampietri, L. Gallardo, O. Baranger, D. y Beigel, F. (2024) ; For URUGUAY-SNI: data extracted from CvUy on January 5, 2024

The detection of the universe of a given full-time R&D national workforce is an approach that also informs on the role played by the available infrastructure in the visibility and circulation of the knowledge produced by different institutions and disciplines. With these case studies we observed the scarce extension of the permanent identifier for active researchers, ORCID, in Argentina, probably hindered by the fact that most Argentinian researchers hold two different positions, one at CONICET and another as professors at a national university. Table 11 shows the incomplete picture that we got of Argentina, Brazil and Uruguay's national research communities in OpenAlex: following 3 different procedures (ORCID, DOI and manual search) we detected 83% of the researchers from the SNI-Uruguay, almost 87% of the CNPq researchers in Brazil and only 57.6% of the total researchers at CONICET. In a work in progress these case studies are being observed with the lens of gender asymmetries, but the first results show that in broader publishing landscapes built with alternative national databases the average articles in English authored by

[13] I thank Luciano Digiampietri and Alysson Fernandes Mazoni for their help in controlling and revising the data.
[14] I thank Yennyfer Feo, Natalia Aguirre and Exequiel Fontans for the curation of the data from CvUy.

men is significantly higher than the production of women in the same language. A considerable gap was also observed between the participation of women in the total researcher positions of all disciplines and their share of citations in Google Scholar (Beigel et al 2023).

7. Final remarks and conclusions

Pinfield (2025) argues that three practices of openness must evolve together: a) scientific openness works where the content, processes and infrastructure of research are made openly available, b) epistemic openness operates when different kinds of knowledge systems are valued and engaged with across and beyond conventional science, and c) participatory openness that exists when as many participants as possible are brought into the conversation and are fully involved in ongoing scientific interactions. We can add that to fulfill this project openness, autonomy, inclusiveness and sovereignty must be mutually reinforced to produce a more equitable research system.

Such a project of inclusive openness deals with two structural obstacles, one dependent on material resources and the other related to the symbolic capital at stake in scientific practice. The first obstacle is the global inequalities forged by the digital divide, and the risks of extraction that openness creates for non-hegemonic research communities lacking the indispensable infrastructures for visibility and recognition. The second emerges from the increasing struggles between commercialization and decommercialization of scholarly publishing and scientific information. These conflicts go beyond the tension of the diamond versus the gold routes, given the fact that the recognition and differentiation among scientists was built under an excellence regime designed by commercial publishers. Accordingly, the feasibility of a real change is ultimately linked to addressing asymmetries with multi-causal factors.

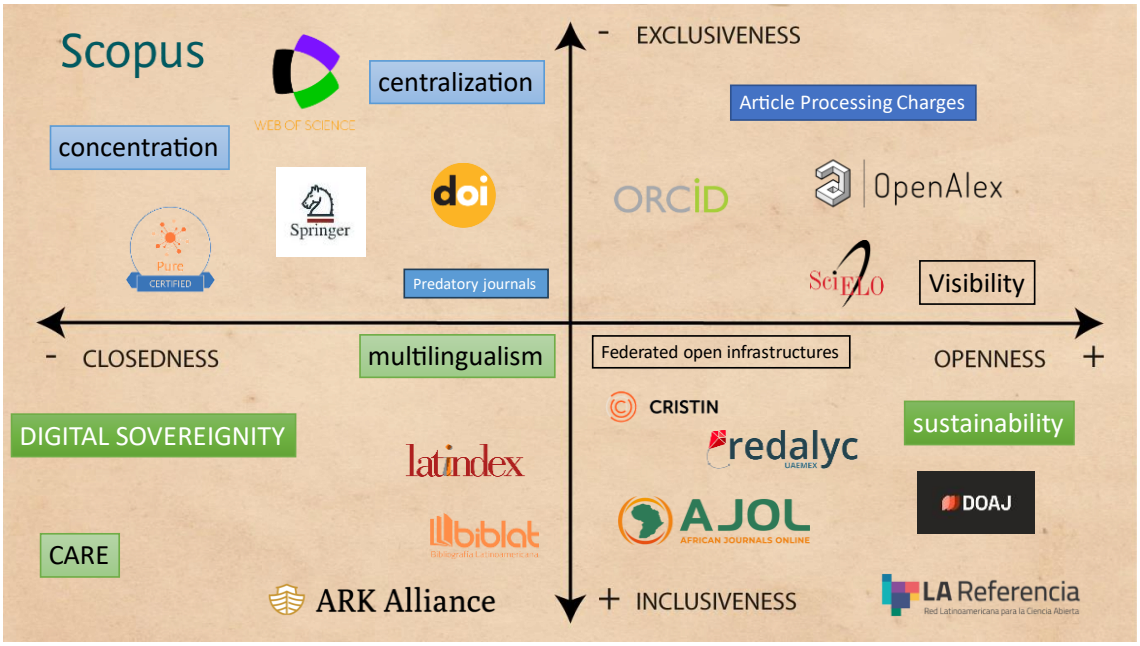
Latin America represents an alternative open access publishing circuit, with diamond journals that are community managed and driven by the principle of science as a common good. However, the “mainstream” circuit still concentrates the belief of the internationalized researchers in the performative effects of the high-impact journals, and this prevents them from changing their paths of circulation at risk of losing recognition. SciELO, Redalyc and Latindex have made enormous efforts to increase visibility and impact, and this regional circuit is sustained by governmental agencies and public institutions. But the academic evaluation defined by these same organizations depreciates these journals, resulting in a form of alienation still unresolved.

Inclusiveness faces strong forces of exclusiveness conducted by oligopoly commercial stakeholders that seek concentration of profitable goods and centralized infrastructures under closed ecosystems. In Figure 15 some examples of these companies are represented in the left upper quadrant. Meanwhile, in the right upper quadrant fully open infrastructures that comply with the FAIR principles, such as OpenAlex, guarantee visibility, but are limited in terms of inclusiveness by the availability of DOI. ORCID can also be located in the right upper quadrant because we discussed that even if it is gratuitous this PID require institutional capacities to expand in the research communities. Another example of limitations to inclusiveness can be found in SciELO Brazil’s shift to English language and the growth of journals with APC charges.

In the lower quadrants of Figure 15 we reinforce the fact that inclusiveness is highly linked to multilingualism and the interculturality of science. Some inclusive stakeholders such as Latindex or BIBLAT have limitations in terms of the availability of metadata at the level of the documents indexed in their services. And the lack of PIDs also diminishes the visibility of this scientific production. As we move to the fully compliance with the CARE principles, high inclusiveness of subaltern groups and the protection of indigenous knowledge autonomous governance may collision with unrestricted openness. Digital sovereignty may, on its part, imply certain degrees of closedness.

Figure 15

The stakeholders in the dynamics of inclusiveness and exclusiveness



The right lower quadrant in Figure 15 agglutinates the best examples of inclusive openness. The Latin American publishing platforms and repositories are relevant stakeholders in the path towards an equitable research system. Its main strength resides in the public investment made by the governments in infrastructure under a general agreement on the definition of science as a common good. It is a heterogeneous region with diverse scientific policies and governance approaches of the scientific information systems that co-exist in a noncommercial publishing ecosystem. The relevant experience in federated infrastructures such as LA Referencia and its local technology gives the region a critical role in a just transition to inclusive open science. However, its internal fragmentation y several platforms and its failure in achieving an interoperable regional infrastructure completes the explanation of its limited global circulation.

To decommercialize scholarly publishing needs incentives in various directions: a) to diamondize learned society's journals coopted by big publishers, b) to sustain improvements in quality diamond journals that have no access to permanent identifiers, c) to create federated infrastructures or d) new networked diamond journals. Guédon (2021) has delved into the advantages of imagining new forms of diamond scholarly publishing through platforms that can

include repositories from public institutions and open publishing platforms. Still, the major challenge is essentially to recover the control of scholarly communication and convince the research community to embrace the value of academic autonomy.

A severe change is undergoing behind the expansion of mega-journals and the pledge for fast-track peer review that blur the original interaction between a given scholarly community and the specific audience of a journal. The homogenization and automatization of editorial management is displacing editors from leading academic decisions. APC prices, payments and waivers that are hardly transparent, and the proliferation of predatory journals have affected now directly the collections of Clarivate and Scopus. There is an increasing undefinition about who are the owners of hundreds of journals, what role the editors play and what is the extent of the intervention of the commercial publishers in defining the quality of the manuscripts accepted for publication. I have argued that a potential crisis of legitimacy seems to emerge from the pervasive effects of commercial open access (Beigel, 2024). This places us also in front of an opportunity for a radical change.

After delivering this keynote in the STI Conference, a colleague approached to continue the dialogue and mentioned the book by Sabina Leonelli (2023), of which I had no notice. Her argument is that the contemporary OS movement focuses on the existing constraints on research communication, collaboration and publishing attempting to address such problems through the provision of incentives to share such outputs as widely as possible. Critically, she warns how diversity can be squashed by demands for fast and smooth sharing of scientific resources and explores alternative interpretations of openness that may take better account of scientific diversity and the empirical insights of how researchers conduct, communicate and discuss their work (Leonellil, 2023). Indeed, to seek inclusive openness entails new definitions of research quality framed in the multilingual horizon of science as an intercultural common good. I believe this is only possible through a deep critique of the concept of “excellence” within contextualized, “situated”, reforms in the research assessment systems. As researchers of science and open science our contribution to this cultural change can come from the creation of responsible indicators of inclusiveness, putting at work multi-scale data sources and collaborating with federated open infrastructures.

Note on the research data

The datasets used for these cartographies will be made available in the repository of CONICET as soon as the curatorship is finished.

Conflict of Interest

The author declares that there is no conflict of interest.

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References

Alperin, J. P., Portenoy, J., Demes, K., Larivière, V. & Haustein, S. (2024). An analysis of the suitability of OpenAlex for bibliometric analyses. STI Conference, Berlin.

Archambault, E. et al (2006). Benchmarking scientific output in the social sciences and humanities: The limits of existing databases. Scientometrics, 68(3):329-342. https://doi.org/10.1007/s11192-006-0115-z

Armengou, C., Aschehoug, A., Ball, J., Bargheer, M., Bosman, J., Brun, V., de Pablo Llorente, V., Franczak, M., Frantsvåg, J. E., Hersperger, O., Klaus, T., Kramer, B., Kuchma, I., Laakso, M., Manista, F., Melinščak Zlodi, I., Mounier, P., Pölönen, J., Pontille, D., ... Wnuk, M. (2023). Institutional Publishing in the ERA: Results from the DIAMAS survey. Zenodo. https://doi.org/10.5281/zenodo.10022184

Authier, C. (2023). Cobertura de los identificadores persistentes (PID) para artículos científicos en Latinoamérica. National Scientific and Technical Research Council.

Babini, D. y Rovelli, L. (2020). Tendencias recientes en las políticas científicas de ciencia y acceso abierto en Iberoamérica. Consejo Latinoamericano de Ciencias Sociales. http://eprints.rclis.org/40955/

Baglioni, M, Manghi, P, Mannocci, A and Bardi, A. 2022. We Can Make a Better Use of ORCID: Five Observed Misapplications. Data Science Journal, 20: 38, pp. 1–12. https://doi.org/10.5334/dsj-2021-038

Basson I, Simard M-A, Ouangre´ ZA, Sugimoto CR, Larivière V (2022). The effect of data sources on the measurement of open access: A comparison of Dimensions and the Web of Science. PLOS ONE. 2022; 17: e0265545. https://doi.org/10.1371/journal.pone.0265545

Beigel, F. & Gallardo, O. (2022) Estudio de accesibilidad de las publicaciones argentinas y gastos en article processing charge en la Agencia de I+D+i (2013-2020), Dossier 7, http://www.ciecti.org.ar/7-estudio-de-accesibilidad-de-las-publicaciones-argentinas-y-gastos-en-article-processing-charges-en-la-agencia-idi-2013-2020/

Beigel, F. (2022). “El proyecto de ciencia abierta en un mundo desigual”, Relaciones Internacionales, nº 50, 163-181. https://doi.org/10.15366/relacionesinternacionales2022.50.008

Beigel, F. (2024) “The transformative relation between publishers and editors: research quality and academic autonomy at stake” Preprint: https://osf.io/z4xb6/ https://doi.org/10.17605/OSF.IO/Z4XB6

Beigel, F. Almeida, A. M., Gallardo, O. et al (2023) “Scientific production and gender inequalities in two academic elites: Brazil and Argentina”, Revue d'histoire des sciences humaines, N° 42, p.255-280. https://doi.org/10.4000/rhsh.8374

Beigel, F. Packer, A. Gallardo, O. & Salatino, M. (2022) “OLIVA: The Scientific output in journals edited in Latin America. Disciplinary Diversity, Institutional Collaboration, and Multilingualism in SciELO and Redalyc (1995-2018)” DADOS, vol. 67, N° 1, 2024. https://doi.org/10.1590/dados.2024.67.1.307x

Beigel, F. y Digiampietri, L. (2022) “The battle of the languages in national publishing. A comparative study of the publishing performance by CNPq (Brasil) y CONICET (Argentina)”, Tempo Social, Vol. 34, N°3, https://doi.org/10.11606/0103-2070.ts.2022.201819

Beigel, F., Sánchez Pereyra, A., Alonso-Gamboa, J. O., Salatino, M., Gallardo, O., Ferreira Gonçalves, A., Carrillo Romero, O., Flores Chávez, M. A., Durán Muñoz, E. y Arguello Mendoza, M. G. T. (2024). OLIVA-2: las revistas iberoamericanas indexadas en Biblat y Latindex: fuentes fundamentales para conocer la producción científica global. e-Ciencias de la Información, 14(1). https://doi.org/10.15517/eci.v14i1

Beigel, F., & Montoya, V. (2024). Perceptions, défis et prises de positions concernant l'Article Processing Charges (APC) dans la publication scientifique: une enquête auprès des chercheur·e·s du CONICET en Argentine (Version v2). Preprint. https://doi.org/10.5281/zenodo.13934964

Beigel, F., Gallardo, O. y Bekerman, F. (2018). Institutional expansion and scientific development in the periphery. The structural heterogeneity of Argentina’s academic field (1983-2015). Minerva. A Review of Science, Learning and Policy, 56(3), 305-331. https://doi.org/10.1007/s11024-017-9340-2

Biagioli, M., Kenney, M., Martin, B., & Walsh, J. P. (2018). Academic misconduct, misrepresentation and gaming: A reassessment. Research Policy, 48(2). https://doi.org/10.1016/j.respol.2018.10.025

Bosman, J., Frantsvåg, J. E., Kramer, B., Langlais, P.-C., & Proudman, V. (2021). OA Diamond Journals Study. Part 1: Findings. Zenodo. https://doi.org/10.5281/zenodo.4558704 Dataset: 10.5281/zenodo.4553103

Da Silviera et al (2023) Taxonomía de la Ciencia Abierta: revisada y ampliada. Encontros Bibli, Florianópolis, v. 28, Universidade Federal de Santa Catarina. DOI: https://doi.org/10.5007/1518-2924.2023.e91712/53422.

De Castro, P. (2019). Sistemas CRIS en Latinoamérica e interoperabilidad con OpenAIRE. LA Referencia, OpenAIRE Technical workshop https://dspacecris.eurocris.org/handle/11366/1176

Debat, H. & Babini, D. (2019). Plan S in Latin America: A precautionary note. https://zenodo.org/record/3332621

Del Rio, J. & Lujano Vilchis, I. (2024) “How Balanced Is Multilingualism in Scholarly Journals? A Global Analysis Using the Directory of Open Access Journals (DOAJ) Database” Journal of Electronic publishing, Vol. 21, N°1. https://doi.org/10.3998/jep.6448

Digiampietri, L., Gallardo, O., Baranger, D., & Beigel, M. F. (2024). Approaching bibliometrics and prosopography: The comprehensive publishing landscape of CNPq (Brazil) and CONICET (Argentina) and its coverage in global databases. In SciELO Preprints. https://doi.org/10.1590/SciELOPreprints.10128

Frank, J., Foster, R. & Pagliari, C. (2023) Open access publishing – noble intention, flawed reality Social Science & Medicine, 317 https://doi.org/10.1016/j.socscimed.2022.115592

Gallardo, O., Milia, M., Appel, A. L., Grip-APC Team, & van Schalkwyk, F. (2024, October 16). When researchers pay to publish: Results from a survey on APCs in four countries. arXiv. https://doi.org/10.48550/arXiv.2410.12144

Guédon, J.C. (2021) La historia de la forma de la revista a través del prisma de la historia de la "gran conversación científica". Revista IUS, https://doi.org/10.35487/rius.v15i0.2021.784

Iniciativa de Budapest para el Acceso Abierto. (2002). Declaración de Budapest (Budapest Open Access Initiative, BOAI). Open Society Institute.

Khanna, S., Ball, J., Alperin, J. P., & Willinsky, J. (2022). Recalibrating the scope of scholarly publishing: A modest step in a vast decolonization process. Quantitative Science Studies, 3(4), 912-930.

The Barcelona Declaration on Open Research Information, https://barcelona-declaration.org/

Krauskopf, E. (2021). Article processing charge expenditure in Chile: The current situation. Learned Publishing, 34(4), 637-646.

Kuchma, I., & Ševkušić, M. (2024). Landscape of no-fee open access publishing in Africa. Zenodo. https://doi.org/10.5281/zenodo.12792474

Kyle Siler, Vincent Larivière (2022) Who games metrics and rankings? Institutional niches and journal impact factor inflation, Research Policy, Volume 51, Issue 10. https://doi.org/10.1016/j.respol.2022.104608

Leonelli, S. (2023) Philosophy of Open Science. Cambridge University Press. DOI: 10.1017/9781009416368

McLean, R., Tijssen, R., Wallace, M. L., & Kraemer-Mbula, E. (Eds.). (2020). Transforming Research Excellence (1st ed.). African Minds.

Michela Bello & Fernando Galindo-Rueda (2020) Charting the digital transformation of science: Findings from the 2018 OECD International Survey of Scientific Authors (ISSA2). OECD Science, Technology and Industry Working Papers. N°3, https://dx.doi.org/10.1787/1b06c47c-en

Muller de Oliveira, G, Umarani P. & Pulido Correa, M. (2024) "Policies and Practices for Global Multilingualism" Íkala, Revista de Lenguaje y Cultura Medellín, Colombia, Vol. 29 Issue 3, pp. 1-10, https://doi.org/10.17533/udea.ikala.358582

Okunei, A. & Chan, L. (2023) "Digital Object Identifier: Privatising Knowledge Governance through Infrastructuring" in Keim, W. & Medina, L. THE ROUTLEDGE HANDBOOK OF ACADEMIC KNOWLEDGE CIRCULATION. Routledge: New York.

Öztürk, O. & Taşkın, Z. (2024). How Metric-Based Performance Evaluation Systems Fuel the Growth of Questionable Publications? Scientometrics, 129, 2729–2748. https://doi.org/10.1007/s11192-024-04991-8

Packer, A. (2024). Multilingualism in Scientific Literature Communicated by Journals from the SciELO Brazil Collection, European Review. Published online 2024:1-21. https://doi.org/10.1017/S1062798724000103

Pavan, C., & Barbosa, M. C. (2018). Article processing charge (APC) for publishing open access articles: The Brazilian scenario. Scientometrics, 117(2), 805-823. https://doi.org/10.1007/s11192-018-2896-2

Pölönen, Janne, Mikael Laakso, Raf Guns, Emanuel Kulczycki y Gunnar Sivertsen. 2020. Open access at the national level: A comprehensive analysis of publications by Finnish researchers. En Quantitative Science Studies. Vol. 1, 1396–1428. https://doi.org/10.1162/qss_a_00084

Red Iberoamericana de Indicadores de Ciencia y Tecnología (RICYT). (2023). El estado de la ciencia: Principales indicadores de ciencia y tecnología Iberoamericanos / Interamericanos. Organización de Estados Iberoamericanos (OEI) & UNESCO.

Salatino, Maximiliano (2017). La estructura del espacio latinoamericano de revistas científicas: (Tesis de Doctorado). Mendoza, Universidad Nacional de Cuyo. Facultad de Ciencias Políticas y Sociales, https://bdigital.uncu.edu.ar/10720.

Second Diamond Open Access Conference. (2023, October 25-26). Global Summit on Diamond Open Access. Toluca, México.

Sellanga, J., Steinhart, G., Tsang, E., & Wako, N. (2024, June 6). [Special issue] 2024 Survey of Recent Open Science Policy Developments. Invest in Open Infrastructure. https://doi.org/10.5281/zenodo.11499591

Simard M. A, Ghiasi G, Mongeon P, Larivière V (2022) National differences in dissemination and use of open access literature. PLoS ONE 17(8): e0272730. https://doi.org/10.1371/journal.pone.0272730

Simard, M.A., Basson, I., Hare, M., Larivière, V., & Mongeon, P. (2023). The value of a diamond: Understanding global coverage of diamond Open Access journals in Web of Science, Scopus, and OpenAlex to support an open future.

Simard, M.-A., Butler, L.-A., Alperin, J. P., & Haustein, S. (2024). We need to rethink the way we identify diamond open access journals in quantitative science studies. In SciELO Preprints. https://doi.org/10.1590/SciELOPreprints.8272

Sixto-Costoya Andrea, Robinson-Garcia Nicolas, Leeuwen van Thed & Costas Rodrigo (2021) Exploring the relevance of ORCID as a source of study of data sharing activities at the individual-level: a methodological discussion, in Scientometrics (2021) 126:7149–7165 https://doi.org/10.1007/s11192-021-04043-5

Steinhart, G., Collister, L., Huang, C., Lippincott, S., Neylon, C., Riordan, D., Sellanga, J., Skinner, K., Thaney, K., Tsang, E. (2024). 2024 State of Open Infrastructure: Trends in characteristics,

funding, governance, adoption, and policy. Invest in Open Infrastructure. https://doi.org/10.5281/zenodo.10934089

Pinfield, S. (2025) The Need for Scientific, Epistemic and Participatory Openness. Routledge: New York.

Tennant JP. (2020) Web of Science and Scopus are not global databases of knowledge. European Science Editing, Vol. 46. https://doi.org/10.3897/ese.2020.e51987

UNESCO (2020) Human Resources in R&D, Fact Sheet No. 61, June 2020, FS/2020/SCI/61.

UNESCO (2023) UNESCO OPEN SCIENCE OUTLOOK 1. Paris: UNESCO.

Vélez Cuartas, G. et al. (2020). Identificación de pagos de APC por parte de las instituciones de educación superior (IES) colombianas. Énfasis en las pertenecientes al Consorcio Colombia. COLAV: Universidad de Antioquia.

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