

Open Research Practices and Researchers' Assessment: A Global Landscape Review

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Abstract

Open Research (OR) and Open Science (OS) have become central to efforts to improve the transparency, accessibility, and reproducibility of research, while reforming Researcher Assessment (RA) toward more responsible approaches that value a broader range of contributions beyond publication-based metrics. This global landscape review maps how OR-related documents, resources, and initiatives have evolved and how they intersect with Responsible Researcher Assessment (RRA), with particular attention to the role of Research Performing Organisations (RPOs) as key implementers of policy and culture change. Using a multi-method search strategy across web search engines, databases, internal project knowledge, and citation-chaining, the authors compiled and coded a dataset of 100 English-accessible, transdisciplinary OR resources published between 31 January 2012 and 31 July 2025. Each resource was categorised by type, topic, intended audience, publication year, and three geographical dimensions (production level, author provenance, and audience reach), and analysed using Excel and Power BI. Findings show a sustained rise in OR documentation over the past 13 years, with a marked acceleration from 2020 to 2023 and peak output in 2021–2022, suggesting increased attention to openness and collaboration during and after the COVID-19 period. Regional production dominates (57%), particularly within Europe, while most resources are written for a global audience (71%), indicating a globalising orientation even when initiatives originate nationally or regionally. Seventeen resource types were identified, with reports and toolkits most prevalent (32% combined), reflecting both strategic guidance and practical implementation support. Topic analysis identified 25 themes, dominated by Responsible Research Assessment (58%) and Open Science/FAIR Data (44%), alongside recurring concerns about metrics, incentives, and reward structures. RPOs were the most frequently addressed audience, followed by funders and researchers, underscoring the institutional locus of change. Key limitations include English-language bias and the exclusion of discipline-specific and less findable resources. Overall, the review evidences a maturing OR ecosystem increasingly shaped by regional collaboration and global dissemination, with assessment reform and data openness as persistent drivers of change.

1. Introduction

In recent years, the global research landscape has increasingly shifted towards openness, with Open Science (OS) and Open Research (OR) playing a central role in shaping both the implementation of Open Research and/or Science Practices (ORP) and emerging approaches to reforming Researcher Assessment (RA) to Responsible Researcher Assessment (RAA). These approaches emphasise transparency, collaboration, accessibility, and reproducibility in research. The movement toward openness has reshaped how research is conducted, shared, reported and evaluated, challenging traditional systems of RRA that typically prioritise and reward publication metrics and quantity over the quality cultural, educational and societal impact of different ways of output and research (Hicks et al., 2015; Wilsdon et al., 2015; DORA, 2012).

ORP encompass a broad range of initiatives and activities designed to make research knowledge publicly accessible and verifiable. These include open-access publications, open data, open peer review, open educational resources, and open-source software, which collectively aim to facilitate knowledge transfer, foster innovation, and enhance the credibility of research by enabling others to verify results and build upon existing work (Vicente-Saez & Martinez-Fuentes, 2018; Ramjoué, 2015; Fecher & Friesike, 2013). ORP has been widely endorsed by international bodies such as United Nations Educational, Scientific and Cultural Organization (UNESCO), and the European Commission (2016) as a means to advance global research equity and accelerate progress, with the UNESCO Recommendation on Open Science (UNESCO, 2021) emphasising inclusivity, equity, and the shared benefits of research as core principles for sustainable advancement. However, the implementation of ORP varies considerably across regions and disciplines; in Europe, for example, initiatives such as Plan S: Making full and immediate Open Access a reality, launched by cOAlition S (2018), mandate that publicly funded research be published in open-access venues, ensuring that research outputs are freely available to all.

Similarly, in the United States, major federal funding agencies such as the National Institutes of Health (2023) and the National Science Foundation (2023) require grant-funded projects to include data management and sharing plans and to provide public access to research outputs, thereby promoting openness, transparency, and the reuse of research results. Nonetheless, collaborative platforms and regional networks, including initiatives supported by the Bill & Melinda Gates Foundation (2017), are helping to bridge these gaps by promoting locally relevant, equitable open-access and open data models, with a particular focus on low- and middle-income country contexts (Chan et al., 2019).

The shift toward OR also necessitates a re-evaluation of RA systems. Traditionally, researchers have been evaluated based on quantitative indicators such as journal impact factors, citation counts, and publication numbers. A heavy reliance on these metrics has been shown to create perverse incentives that encourage competition, selective reporting, salami slicing, and engagement with low-quality or predatory outlets, rather than fostering transparency and

collaboration (Wilsdon et al., 2015; Aubert Bonn & Bouter, 2023). In response, global initiatives such as the San Francisco Declaration on Research Assessment (DORA, 2012), the Leiden manifesto for research Metrics (2015), and the Hong Kong Principles and Coalition for Advancing Research Assessment (CoARA, 2019) advocate for more collective, informative, and responsible evaluation practices. These frameworks emphasise qualitative assessment, recognition of diverse research outputs (including datasets, software, and policy briefs), and the value of practices that enhance research integrity and societal benefit. These approaches are also more aligned with the emergence of narrative CVs, allowing researchers to describe their contributions, achievements, and impact in a qualitative, contextualised manner, rather than relying primarily on quantitative metrics such as publication counts or journal impact factors (UKRI, 2025).

Several countries and Research Performing Organisations (RPOs) are reforming their evaluation systems accordingly. For example, the Netherlands' Recognition and Rewards initiative, launched in 2020, aims to broaden assessment criteria to value a wider range of academic contributions, including teamwork, open science practices, outreach, and societal relevance, rather than narrowly focusing on traditional publication metrics (Rushforth, 2025). Similarly, both the UKRI Research Excellence Framework (REF) Impact (2022) and UK's Research Excellence Framework 2029 (REF2029, 2022) have increasingly emphasised impact beyond academia by assessing the societal, cultural, economic, and policy benefits of research, in addition to research outputs, and is evolving its assessment criteria to value people, culture, and research environment more broadly. The global shift toward OR practices represents a paradigm change in how knowledge is created and shared. Yet, to fully realise the potential of openness, traditional researcher assessment systems must evolve to value transparency, collaboration, and social relevance over narrow publication metrics and numbers. The alignment of incentives with the principles of OR, the international research community can create a more equitable, trustworthy, and impactful scientific ecosystem that benefits not only researchers but also society.

Understanding the global landscape of OR documents, resources, and initiatives is essential for examining how different countries, RPOs, and stakeholders adopt and implement OR principles across diverse contexts. The aim of this landscape review is to provide a comprehensive global overview of the evolution of OR – related documents, resources, and initiatives, and to examine how these developments support transparency, collaboration, and equitable access to research knowledge. To achieve this aim, the review pursues four key objectives: (KO1) to map the geographical and institutional origins of OR documents and initiatives, identifying who produced them and where they emerged; (KO2) to analyse how these documents and initiatives have evolved over time and to identify key trends; (KO3) to examine how OR initiatives have responded to changing research and societal challenges; and (KO4) to explore how these initiatives engaged with different stakeholder groups, including whom they were designed for and how they interacted with research communities and broader society. Together, these objectives aim to provide evidence-based insights that are

feasible and applicable to support policymakers, funders, and RPOs in fostering more responsible, equitable, and impactful global research ecosystems that advance research excellence and deliver broader societal benefits.

2. Conceptual Frameworks

The foundation of this landscape review is the collection and evaluation of OR initiatives and resources from across the globe. This approach was selected because a landscape review provides a broad, descriptive overview of a field by synthesising diverse sources of evidence, including academic literature, policy documents, and grey literature, to map key concepts, initiatives, stakeholders, and emerging trends. ORPs encompass a rapidly evolving and heterogeneous set of policies, practices, and implementations that extend beyond peer-reviewed research alone. Unlike systematic or scoping reviews, which typically focus on narrowly defined research questions and bodies of empirical evidence, a landscape review is better suited to capturing the breadth, contextual variation, and policy-driven nature of ORP across disciplines and regions. The materials reviewed, therefore, include a wide range of research-related outputs, such as toolkits, projects, reports, and announcements, spanning diverse research types and disciplines. Given the global scope of these resources, it is important to acknowledge that Open Research is not universally defined or applied in a uniform manner and has been interpreted in multiple ways over time (Levin et al. 2016; Vicente-Saez and Martinez-Fuentes, 2018). Different nations and RPOs interpret and represent the concept in varying ways. For the purposes of this review, the selected documents and initiatives were those that align with the contemporary understanding of OR as “transparent and accessible knowledge that is shared and developed through collaborative networks” (Vicente-Saez and Martinez-Fuentes, 2018, p. 434), which emphasizes the conduct and dissemination of research supported by transparency, accessibility, and collaboration throughout the entire research process.

The successful application of ORP is driven by a commitment to make research outputs openly available to the wider public, encompassing all stages of the research lifecycle, from the formulation of initial ideas to the presentation of results and the documentation of limitations. This includes sharing data, methodologies, software, and peer-review materials, enabling others to replicate, evaluate, and build upon the research. The overarching goal is to foster reproducibility, efficiency, and integrity in scholarly inquiry while promoting innovation and collective progress, an approach that has demonstrated its value in recent years (Huang et al. 2024, pp. 841-842).

Within the wider European research community, however, the term Open Science is more frequently used (UNESCO, 2021; Science Europe, 2022). Consequently, documents and initiatives that focused primarily on OS were also included in this review. This does not imply that the terms were used interchangeably by the research team; rather, they were considered complementary yet distinct. While OR represents a broader concept that spans all academic disciplines, including the humanities, social sciences, arts, and applied fields, OS typically

refers to efforts within the scientific disciplines to make research data, methods, and findings openly accessible.

A critical player within the relationship between ORP and Responsible Researcher Assessment (RRA) is Research Performing Organisations (RPOs), as they function as intermediaries between global policy frameworks and everyday research practice. As the primary institutional settings in which research is produced, governed, and evaluated, RPOs are responsible for translating international and national commitments to openness into concrete policies, infrastructures, and support mechanisms. This includes the development of institutional strategies for open access publishing, data management and sharing, research integrity, and public engagement, as well as the provision of training, legal guidance, and technical infrastructure. Thus, ORP are frequently adopted in practice and closely linked to organisational leadership, disciplinary cultures, available resources, and the incentive structures embedded within institutional evaluation systems (Fecher & Friesike, 2013).

Within this context, RRA plays a pivotal enabling role, as assessment systems strongly influence what researchers prioritise and how research quality and success are defined. Traditional approaches to basic RA, which emphasise publication counts, journal impact factors, and citation-based metrics, have been widely criticised for discouraging openness, collaboration, and responsible research behaviours, while incentivising narrow productivity and competition (Hicks et al., 2015; Wilsdon et al., 2015). In response, emerging RRA frameworks advocate for broader, more qualitative forms of evaluation that recognise diverse research contributions, including open data, software, teaching, teamwork, and societal engagement. Initiatives such as the DORA (2012) and CoARA (2019) explicitly link assessment reform to the promotion of OR and RRA cultures, emphasising alignment between incentives, integrity, and societal relevance.

From a conceptual perspective, ORP and RRA are best understood as mutually reinforcing components within the organisational environment of RPOs. ORP provide the practical mechanisms through which openness, transparency, and reproducibility are enacted, while RRA shapes the incentive structures that determine whether such practices are valued and sustained over time. Where assessment systems are aligned with OR principles, RPOs are better positioned to embed openness into research cultures in a durable and meaningful way. This interdependence highlights the importance of examining ORP and RRA together within a global landscape, as differences in institutional capacity, policy alignment, and assessment reform significantly contribute to the uneven adoption of OR across regions and disciplines (UNESCO, 2021; CoARA, 2019).

3. Methodology

3.1 Data Collection and Categorisation Approach

Early in the process, the project team recognised that search engines, including Google Scholar, were not the most suitable tools in this context, as they predominantly index academic journals and books rather than policy documents, organisational initiatives, and practical resources that were central to the project's objectives. Thus, this review adopted a multi-method approach. Initial keyword searches, such as open research, open science, and open data, were conducted across Google, Bing and other databases to capture a wider range of results and to mitigate the inherent biases of individual search platforms. As the team's familiarity with the range of available OR resource types, topics, and terminologies grew, the search strategy was expanded to incorporate additional keywords, such as open research toolkit and open research policy. This enabled the project to capture a broader set of materials relevant to the evolving landscape. Within these resources, the team identified numerous referenced policies, initiatives, and related documents, which were subsequently reviewed and included when deemed relevant to the project's objectives.

Further insights were gathered through internal project meetings; whenever team members became aware of new OR initiatives or emerging opportunities, these were systematically added to the review. Once a resource was identified, it was catalogued using a predefined coding framework to ensure consistency. The included dataset was then categorised and catalogued per entry using a defined set of codes: title, publication date, description, resource type, URL, resource theme, intended audience, and three geographical dimensions (production, author location, and audience location), as below:

- a) Title: The title refers to the name of the publication, report, project, or initiative.
- b) Publication date: The publication date reflects when the resource was published or when the project was completed. In many cases, the exact date, particularly for blogs or less formal publications, was unclear. As a result, dates were standardised to the year only. While capturing exact dates could have enabled seasonal or temporal analysis, this was not feasible due to the inconsistent availability of detailed timing information.
- c) Description: A brief summary of each resource was recorded to provide quick context and clarity regarding its content.
- d) Resource type: Resources were classified by type. The volume and discipline-specific nature of academic articles made them unsuitable for this analysis. Therefore, the dataset focused on broader resources aligned with the study scope.
- e) URL: A link to the original resource was recorded for direct access.
- f) Resource themes: Resources were categorised by theme, such as research assessment, open science/FAIR data, Metrics (e.g., h-Index), among others.

- g) Intended audience: The perceived intended audience was noted. Where it was not explicitly stated in the resource, the team inferred and assigned an audience based on content and purpose.
- h) Geographical Classifications: Three geographical attributes were applied:
 - a. Geographical production: Classified as national, regional, or global.
 - b. Geographical author: Identified the author's geographical origin, based primarily on nationality.
 - c. Geographical audience: Indicated the target market or audience location (national, regional, or global), providing insight into the intended reach and relevance of each resource.

3.2 Data Processing and Analysis

Once all data had been defined and categorised, the team created a structured database in Microsoft Excel. This approach enabled systematic data cleaning, sorting, and organisation across the various categories and resource types. Using Excel's built-in tools, the dataset was refined to ensure consistency and accuracy in preparation for further analysis and dissemination.

After cleaning, the dataset was imported into Microsoft Power BI (Version: 2.148). This platform enabled a deeper evaluation and visual exploration of the data. Through Power BI, the research team examined overall trends, drew comparisons across time and geography, and identified sufficient information to support a detailed assessment of five key thematic areas. These areas form the foundation of the analytical framework used to interpret the dataset.

3.2.1 Overall Landscape

The first area of focus examines the overall global landscape of OR documents/resources. This analysis explores the nature and quantity of evaluated documents, determining how many exist and when they were published. By charting publication trends over time, this section highlights historical patterns and provides insights into potential future developments. Specifically, it addresses the following questions:

- How many OR documents are there?
- When were these OR documents published?

3.2.2 Geography and Provenance

The second thematic area considers the geographical and institutional provenance of the documents. It investigates who produced the documents/resources and which regions or audiences they were designed to target. This includes analysing whether documents were produced at a national level for international audiences, or vice versa, to reveal how the intended reach and focus of OR outputs have evolved over time. The key questions addressed include:

- Who produced the documents?
- What geographical areas are the documents written for?

3.2.3 Resource Types

The third area focuses on the types of documents/resources represented within the dataset. This analysis identifies the most common document types, examines how their prevalence changes year by year, and explores relationships among resource type, geographical origin, and intended audience. It also highlights shifts in the composition of OR resources and their roles within the broader academic ecosystem. The specific questions guiding this analysis are:

- How many resource types are there?
- What are the most common resource types?
- How are the resource types distributed across the years?
- How do the resource types relate to geographical production and audience?

One of the key limitations identified in this area concerns the inclusion of articles as a resource type in the landscape review. Initially, articles were part of the dataset; however, it became apparent that many of them only referenced OR as a secondary concept rather than as the primary focus. In most cases, these articles were driven by specific research questions, with OR serving merely as a contextual or methodological element rather than the central topic of investigation. While the inclusion of such articles could have offered valuable insights, especially given that many research funders now require data and outputs to be openly accessible, doing so would have risked diluting the scope of the review. Including these publications would likely have overshadowed documents that explicitly and substantively addressed OR as their core theme, rather than as a peripheral consideration.

3.2.4 Resource Themes

The fourth thematic area maps and analyses the dominant themes present in the dataset. It tracks how these themes evolve over time, connects them to concurrent academic discussions, and relates them to different resource types. This area identifies the most prevalent themes and explores how their prominence changes throughout the years. The main questions examined include:

- What are the main themes?
- How do the themes change over time?
- How do the themes relate to the resource type?
- Which OR documents address the most themes, and how does this vary over time and by resource type?

3.2.5 Intended Audiences

The fifth and final area focuses on the intended audiences of the documents. It identifies the primary target groups, such as RPOs, researchers, and practitioners, and examines how audience focus has shifted in recent years. The analysis also explores the relationship between audience and resource type, identifying which audiences are most frequently addressed and how this evolves over time. The key questions considered include:

- Who is the main targeted audience?
- How does the targeted audience change over the years?
- How does the targeted audience vary by document type?
- Which documents address the most audiences, and how does this change over time and by resource type?

4. Results and Discussions

4.1 Overall Landscape

A total of 100 OR documents/resources have been included and analysed in this work. During the selection process, numerous articles and OR policy documents were identified that were strongly influenced by specific disciplines. As outlined in the methodology, these were excluded because the analysis focused on OR resources adopting a transdisciplinary approach, rather than those limited to particular research areas or industries. The initial pool was further refined based on language and accessibility constraints. While the team identified several national-level OR policies, many were published exclusively in their original languages. Including these would have resulted in a dataset that was not fully accessible to readers. In addition, some relevant documents were embedded within broader institutional websites and were therefore excluded due to considerations of findability and accessibility.

Given the critical role of OR in shaping the future of research and university development, priority was given to documents that were readily and easily accessible. Resources in which OR was only a secondary or peripheral objective, or those requiring extensive navigation to locate, were excluded. Although some policy documents, initiatives, and academic articles referenced OR, they often treated it as a secondary outcome rather than a central and active focus. Consequently, this study prioritised documents where OR was a primary aim. This approach allows for a subsequent phase of analysis in which excluded documents and initiatives may be incorporated, enabling a deeper exploration of how specific governments, RPOs, and disciplines engage with OR and/or OS and RAA.

Among the resources evaluated, the majority were published after 2020, reflecting a recent acceleration in OR activity (for a complete list of included documents and resources, see Dataset 1 in the supplementary materials). The earliest identified OR resource, European Science Foundation: Evaluation in Research and Research Funding Organisations (2012), dates back to 2012 and consolidates findings from three working groups focused on quality assurance and evaluation guidelines. This publication primarily addresses research and researcher assessment, targets RPOs and funders, and adopts a largely global perspective. Between 2012 and 2018, OR publications increased steadily, followed by a pronounced surge from 2020 to 2023. The peak years were 2021 and 2022, with approximately 18 documents published in 2021 and 23 in 2022 (Figure 1).

This notable rise coincided with the global COVID-19 pandemic, suggesting a possible link between the pandemic and the growing emphasis on OR, data transparency, and international collaboration. Although a slight decline was observed in 2024, the trend in 2025 indicates renewed growth. Overall, over the past 13 years, there has been a consistent upward trajectory in OR documentation, with trends suggesting continued expansion in the coming years.

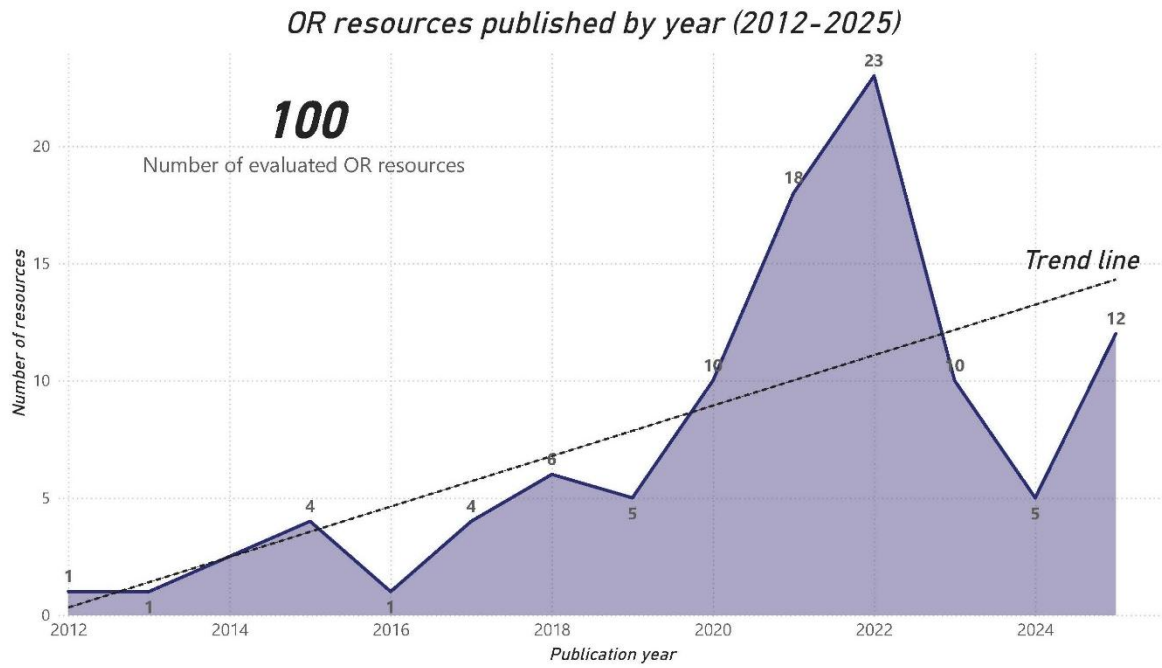


Figure 1: This Figure shows the annual number of OR documents published between 2012 and 2025. Figure created by authors, 2025.

4.2 Geography and Provenance

An analysis of the provenance and geographical distribution of the 100 OR documents/resources reveals distinct patterns in both production and intended audience. Of these, 15 (15%) documents were produced at the national level, 57 (57%) at the regional level, and 28 (28%) at the global level (Figure 2). In this work, the term regional refers to a group or consortium of nations, such as Europe, the term national refers to a single nation, such as Germany, and the term global refers to the broader global context. Among the nationally produced documents, the largest contributions (in descending order) came from the United Kingdom (7; 7%), the Netherlands (2; 2%), Germany (2; 2%), Finland (2; 2%), Norway (1; 1%), and Australia (1; 1%). Examples include reports and projects developed by the UK Research and Innovation (UKRI) and the Council of Australian University Librarians (CAUL).

From an annual perspective, the provenance of OR outputs has remained relatively consistent, with regional-level initiatives dominating throughout the years. Since 2023, the number of nationally produced documents has declined, reflecting a growing tendency towards collaboration across regions and global networks. This trend indicates that the OR landscape is increasingly shaped by cross-national partnerships and collective initiatives rather than by individual national efforts. Overall, the data suggest that regional collaboration - particularly

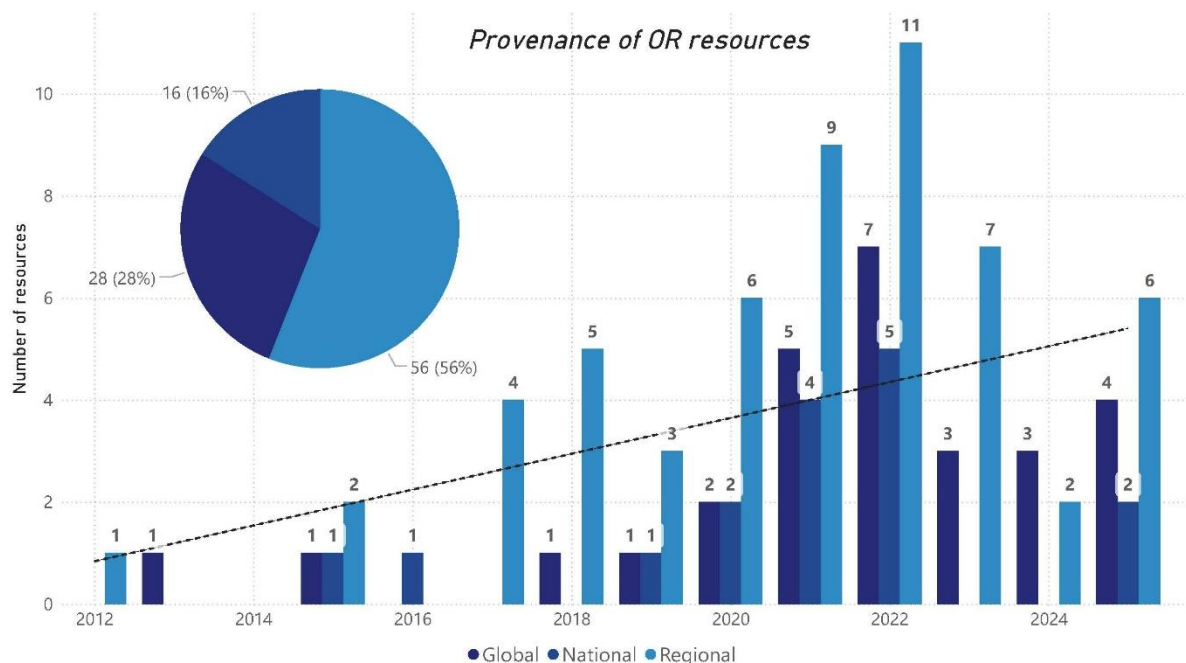


Figure 2: This Figure shows the provenance of OR documents on a global, national and regional level. Graph made by authors, 2025.

within Europe - represents the largest share of OR outputs, underscoring the importance of international cooperation in advancing OR practices.

It is also noteworthy that the geographical scope of the intended audience does not mirror the proportions observed in geographical authorship (Figure 3). While only 28 documents (28%) were produced at the global level, approximately 71 documents (71%) were directed to a global audience. In contrast, 14 documents (14%) targeted regional audiences, and the remaining national-level documents primarily addressed OR within their respective domestic research environments. It shows a trend that nationally produced OR resources focus primarily on their own populations, whereas regional resources (i.e., those produced at the European level) target a much wider audience. This disparity highlights the increasingly global orientation of OR communication, even when production originates from national or regional contexts.

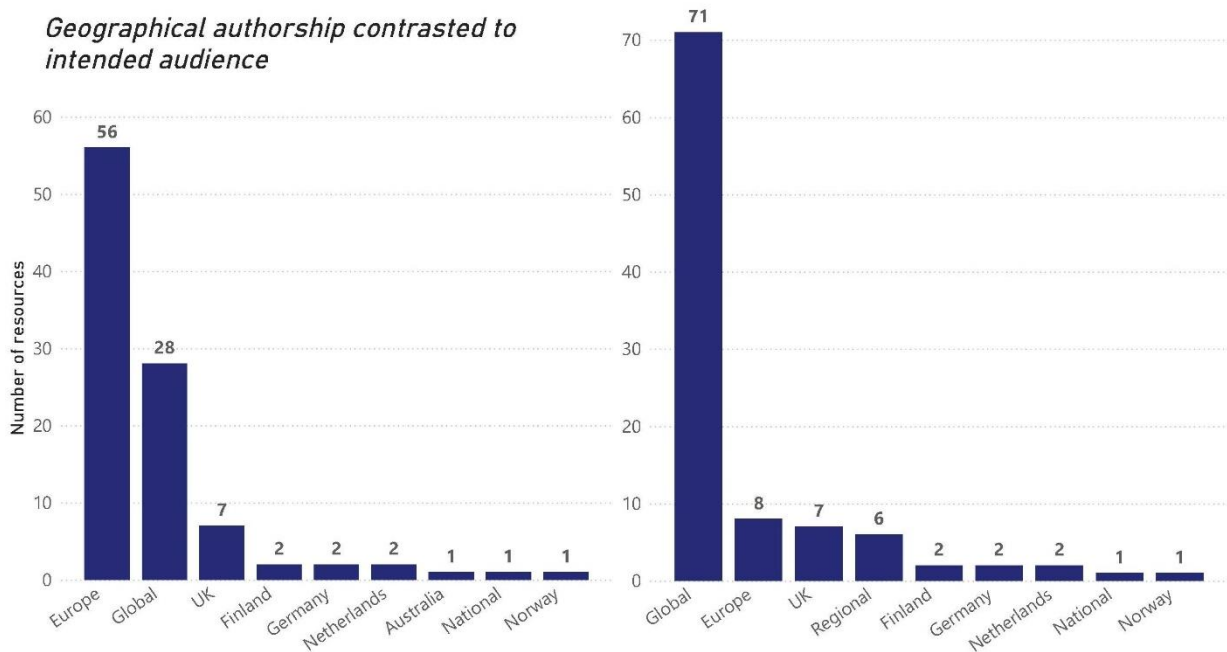


Figure 3: This Figure shows the contrast between the geographical authorship and the intended audience of the resources. Graph made by authors, 2025.

4.3 Resource Types

Analysis of the 100 OR documents identified 17 distinct document types, including the percentage distribution of each document type across the reviewed dataset, as presented in Table 1. Among these, reports and toolkits were the most common, each represented by 16 documents, together accounting for 32% of the total dataset. These were followed by position statements and projects, both of which appeared with moderate frequency (11% each). Less frequently represented types included briefing papers (1%), infrastructure providers (1%),

Type of OR resource	Description	%
Action Plan	Strategic document outlining concrete steps or timelines for implementing specific OR goals or policies.	3
Agreement	Formal accord between organisations or stakeholders establishing commitments to OR practices or data sharing.	2
Announcement	Short communication or public notice introducing new initiatives, milestones, or policy developments in OR.	1
Blog Post	Informal, narrative-style publication sharing perspectives, updates, or reflections on OR topics or practices.	2
Briefing Paper	Analytical document providing background information and recommendations on specific OR issues.	1
Declaration	Public statement of intent/principle, endorsed by multiple stakeholders to express shared commitments to OR.	2
Guideline Recommendation	Practical document outlining procedures, best practices, or standards for conducting or supporting OR.	10
Infrastructure Provider	Resource describing or produced by entities that offer digital, technical, or institutional infrastructure for OR.	1
Initiatives/Policy Framework	Foundational document establishing coordinated programmes, strategies, or regulatory frameworks for OR implementation.	7
Landscape/Literature Review	Analytical overview summarising existing OR research, policies, or initiatives.	9
Organisations Coalition	Governance document outlining the mission, structure, or collaborative approach of OR.	2
Position Statement/Paper	Document expressing an organisation's or network's viewpoint on OR policy, principles, or practices.	11
Principles	Foundational value statements articulating key ethical or operational tenets guiding OR efforts.	1
Project	Description or summary of funded or collaborative projects undertaken to advance OR objectives.	11
Report	Comprehensive document presenting findings, analyses, or evaluations related to OR practices, performance, or policy.	16
Toolkit	Practical resource offering templates, workflows, and actionable tools to support implementation of OR approaches.	16
Working Group	Outputs produced by OR groups addressing specific aspects or challenges of OR.	5

Table 1: This Table presents the 17 identified OR document types, including a brief description of each and their distribution across the evaluated dataset.

principles (1%), and announcements (1%). When examining document types over time, reports were the earliest and most dominant form, particularly from 2012 to 2017. From 2017 onwards, the diversity of document types increased, peaking between 2020 and 2024, when all 17 resource types were represented, especially in 2022, which saw the widest variety of outputs.

In recent years, a gradual decline in reports has been observed. While reports remained significant through 2022, their frequency decreased between 2023 and 2025. In contrast, toolkits, which first appeared around 2018, have remained consistently active and widely used. Projects and position papers also maintained a steady presence since 2020, reflecting their continuing relevance as formats for OR dissemination.

An examination of the relationship between resource types and their provenance within the 100 evaluated OR documents revealed several notable patterns (Figure 4). All resource types, reports and toolkits are the most prominent. Despite having equal representation (both at 16%), these two types exhibit distinct geographical distributions. Reports were produced predominantly at the regional level, accounting for 13 of the 16 identified documents. Only two were produced globally, and one at the national level. This suggests that reporting activities in OR are largely driven by regional collaborations, particularly within European networks and cross-national initiatives. In contrast, toolkits demonstrate a more balanced geographical spread. Of the 16 toolkits identified, seven were of global provenance, six were national, and three were regional. This broader distribution reflects the adaptable and widely applicable nature of toolkits, which are often designed for implementation across varying institutional and national contexts.

A similar pattern is visible in other document types, particularly projects, which also show a strong regional orientation (Figure 5). Of the 11 project documents, 10 originated from regional collaborations and 1 from a global initiative. This reinforces the finding that regional cooperation remains a key driver in the production of OR outputs. At the national level, several countries stand out for their specific contributions. The Netherlands, Finland, and Norway were particularly active in producing toolkits, while Germany was one of the few countries to have developed an announcement dedicated to OR. These examples illustrate both the diversity of engagement and the varying capacities of national research systems to contribute to OR initiatives.

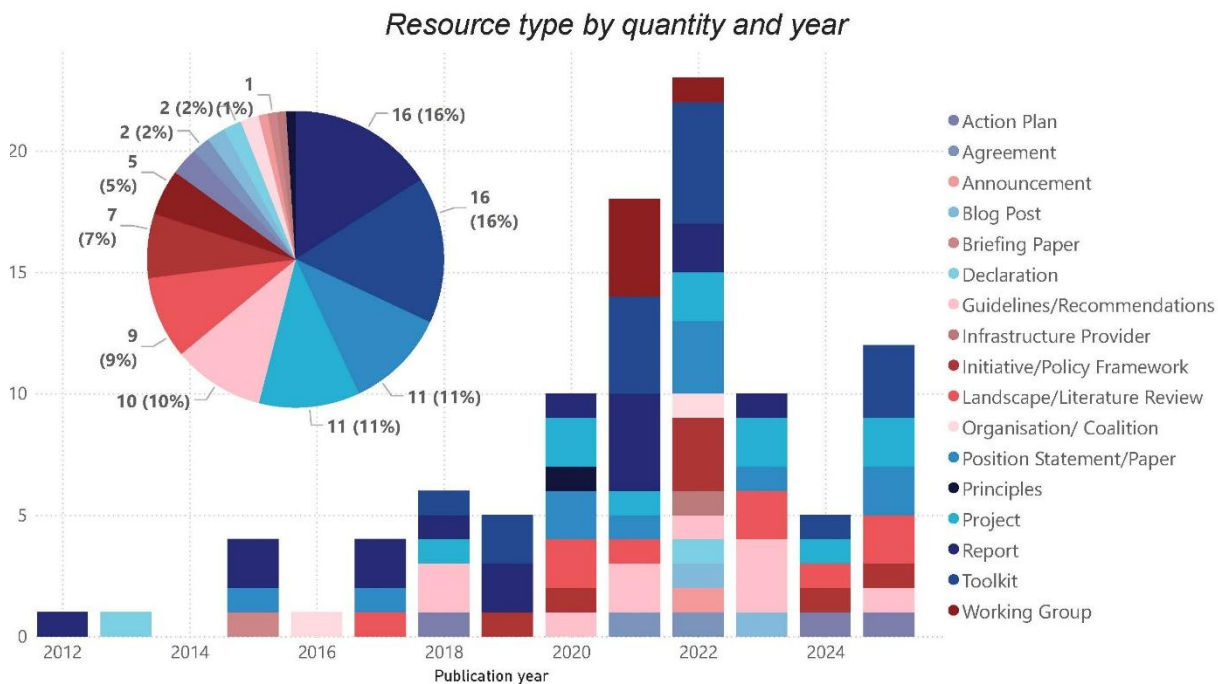


Figure 4: This Figure shows the distribution of OR document types across 100 analysed OR resources (2012–2025) and the number of resource types encountered during the OR landscape review. Figure created by authors, 2025.

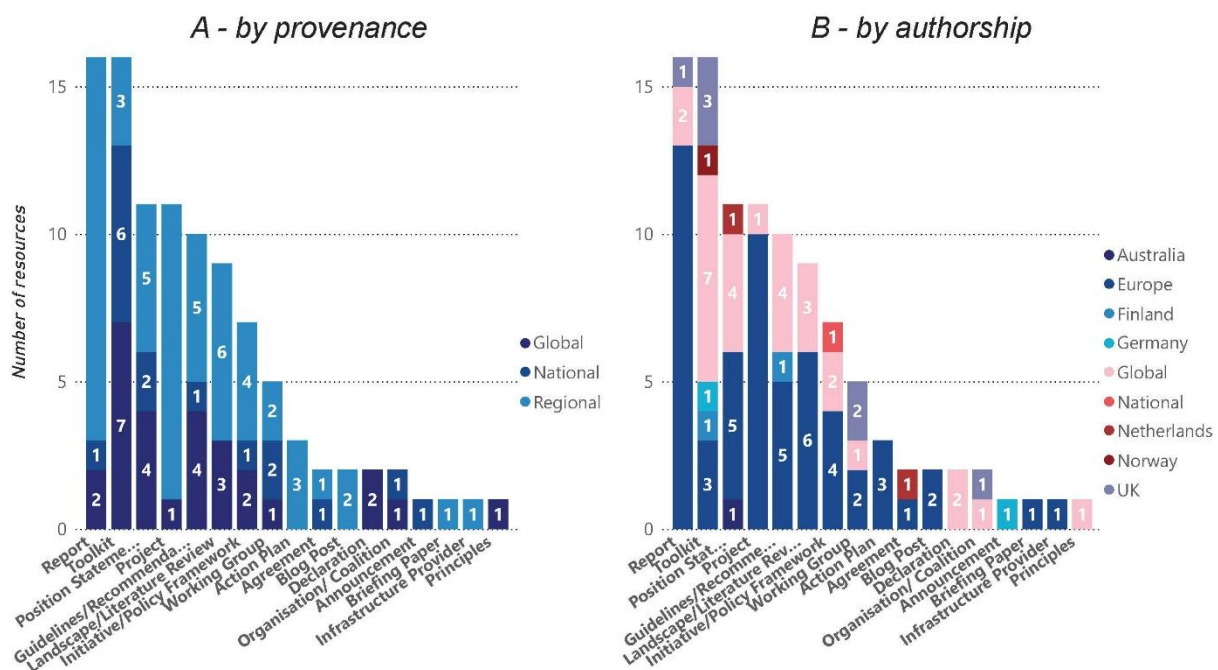


Figure 5: This Figure shows the resource types divided by provenance (A) and by authorship (B). Figure created by authors, 2025.

4.4 Resource Topic

Across the 100 evaluated documents, a total of 25 distinct research themes were identified (Figure 6). The frequency with which these themes appeared varied significantly between documents. Among all the themes, Responsible Research Assessment (RRA) emerged as the most prominent, being present in fifty-eight of the documents (58%). This was followed by the theme of Open Science/FAIR Data, which appeared in forty-four documents (44%). These two themes were clearly dominant across the body of material examined, indicating that issues related to research evaluation and data openness have been central topics of discussion in recent years.

Beyond these two leading themes, several others featured prominently, although less frequently. These included Metrics (e.g., h-index) (22%) as well as Responsible Research and Innovation (RRI) (17%), Reward and Recognition (16%), and Benefits and Incentives (15%). Together, these topics reflect a growing concern within the research community about how excellence is measured, how responsible practices are encouraged, and how researchers are supported and acknowledged for their contributions. Other themes, such as Narrative CVs (2%), Precarity (2%), and Citizen Science (2%), were mentioned only occasionally, appearing in a small number of documents. Their limited presence suggests that while these topics are emerging areas of interest, they have not yet gained widespread prominence within the broader OR landscape.

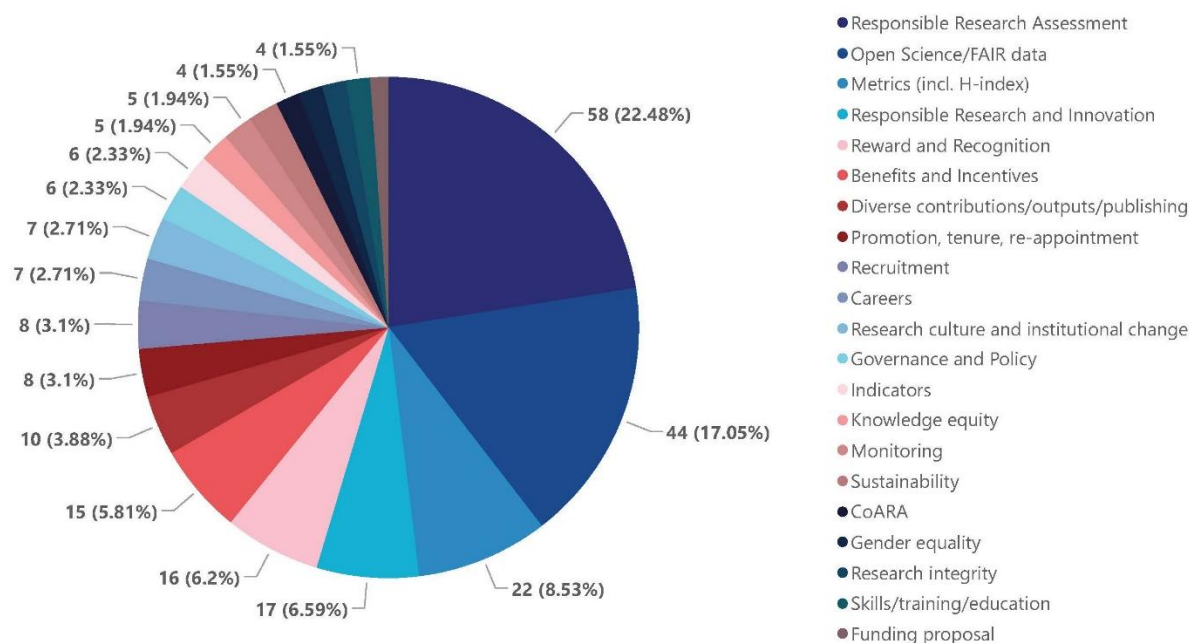


Figure 6: This Figure shows the presence of the various identified research themes across the evaluated OR resources. Figure created by authors, 2025.

Examining the six main themes - RRA, Metrics (incl. the h-index), RRI, Reward and Recognition, Benefits and Incentives, and Open Science/FAIR Data - across the timeline from 2012 to 2025 reveals clear shifts in emphasis. In the earlier years, between 2012 and 2015, RRA and Metrics (e.g., h-index) dominated the conversation, reflecting the sector’s focus at the time on evaluation frameworks and quantitative indicators. By 2017, a broader range of topics began to emerge, marking the beginning of a more diversified discussion about OR practices and policies. From 2020 onwards, nearly all of the six major themes appeared consistently across the documents, showing how the conversation has expanded to include a more holistic understanding of research systems. Throughout this period, RRA remained a constant topic, while Reward and Recognition, as well as RRI, also continued to feature regularly. Metrics (e.g., h-index) persisted as enduring themes, maintaining their relevance in discussions about measuring research impact.

When considering the different types of documents analysed, the distribution of these key themes provides further insights (Figure 7). Agreements were found to focus primarily on RRA, underlining the importance of evaluation standards in formal collaborations and policy frameworks. Announcements and infrastructure providers' documents most often discuss RRI, alongside RRA, highlighting the operational aspects of implementing ethical and sustainable OR practices. Briefing papers tended to concentrate on Metrics (e.g., h-index), reflecting their analytical and evaluative nature. Finally, documents produced by organisations and coalitions frequently addressed Metrics (e.g., h-Index) as well as Reward and Recognition,

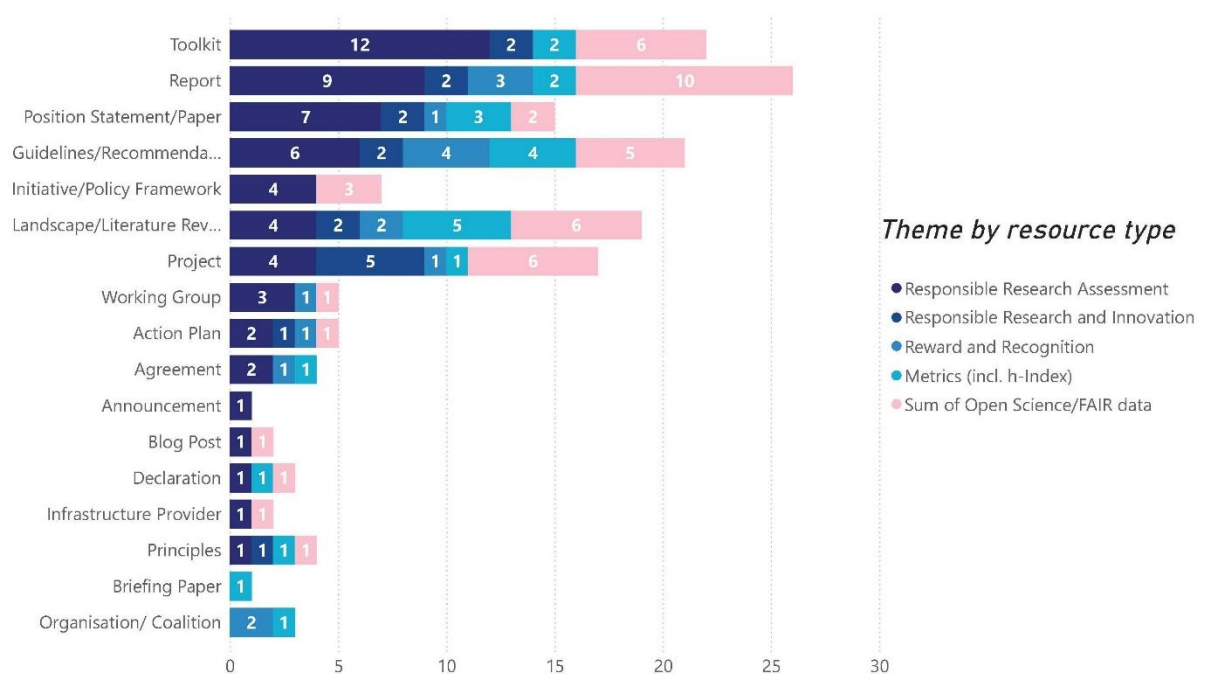


Figure 7: This Figure shows the five most frequent resource topics and the resource types in which they appear. Figure created by authors, 2025.

illustrating the institutional concern with developing fair and transparent systems for measuring and incentivising research performance.

In summary, while a wide range of twenty-five themes were identified across the 100 evaluated documents, a smaller set of six core themes clearly dominated the research landscape. Over time, the focus of the discourse has expanded from narrow discussions of assessment and metrics toward a more comprehensive view that integrates principles of OS and/or OR, RRI, and Equitable Recognition. This evolution reflects a maturing research ecosystem that increasingly values not only the measurement of outputs but also the quality, integrity, and inclusiveness of the research process itself.

4.5 Intended Audiences

During the evaluation of the 100 documents, 10 distinct intended audience groups were identified (Table 2). Among these, RPOs were by far the most frequently addressed audience, appearing in 51 documents (approximately 20.3% of the total). They were followed by funders (38 documents, 15.1%) and researchers (33 documents, 13.2%). In contrast, service providers and the general audience were the least represented, explicitly targeted in only 12 and 8 documents, respectively (Figure 8).

Intended audiences	Description	Addressed within OR documents
RPO	Universities, research organisations, and academic institutions that develop, implement, and uphold open research policies and infrastructure.	51
Funders	National and international funding bodies or agencies responsible for setting up requirements and providing financial support for open research initiatives.	42
Researchers	Individual academics, scientists, and scholars engaged in producing and sharing open research outputs.	33
Policymakers	Government or organisational decision-makers who establish policies and frameworks to promote openness and transparency in research.	29
Libraries and Journals	Information services and publication platforms that play a key role in disseminating, curating, and ensuring accessibility of open research materials.	24
Individual Organisations	Non-academic or independent entities, including NGOs, research alliances, or advocacy groups, that contribute to or support open research practices.	21
Leaders/Managers/ Stakeholders	Institutional or organisational executives and administrators responsible for implementing open research strategies and overseeing compliance. Including broader groups with vested interests in open research outcomes, including professional associations, community partners, and sectoral networks.	20
Governments	National or regional government departments that promote, regulate, or evaluate open research initiatives within public policy contexts.	15
Service Providers	Technical and digital infrastructure providers offering platforms, repositories, and tools to facilitate open access and data sharing.	12
General Audience	Members of the public, educators, or media audiences engaging with open research outputs for learning, awareness, or societal benefit.	8

Table 2: This Table presents the various intended audiences across the OR document types, including a brief description of each and the number of times they were addressed across the documents.

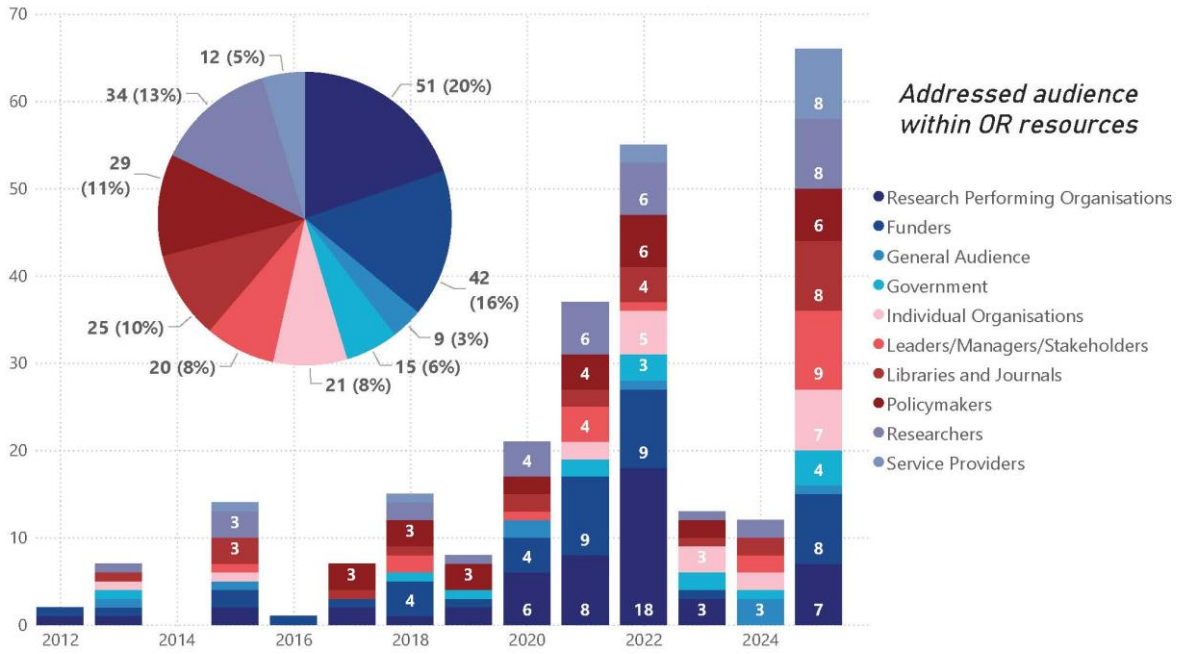


Figure 8: This pie chart shows the number of intended audiences identified in the 100 analysed OR documents. Figure created by authors, 2025.

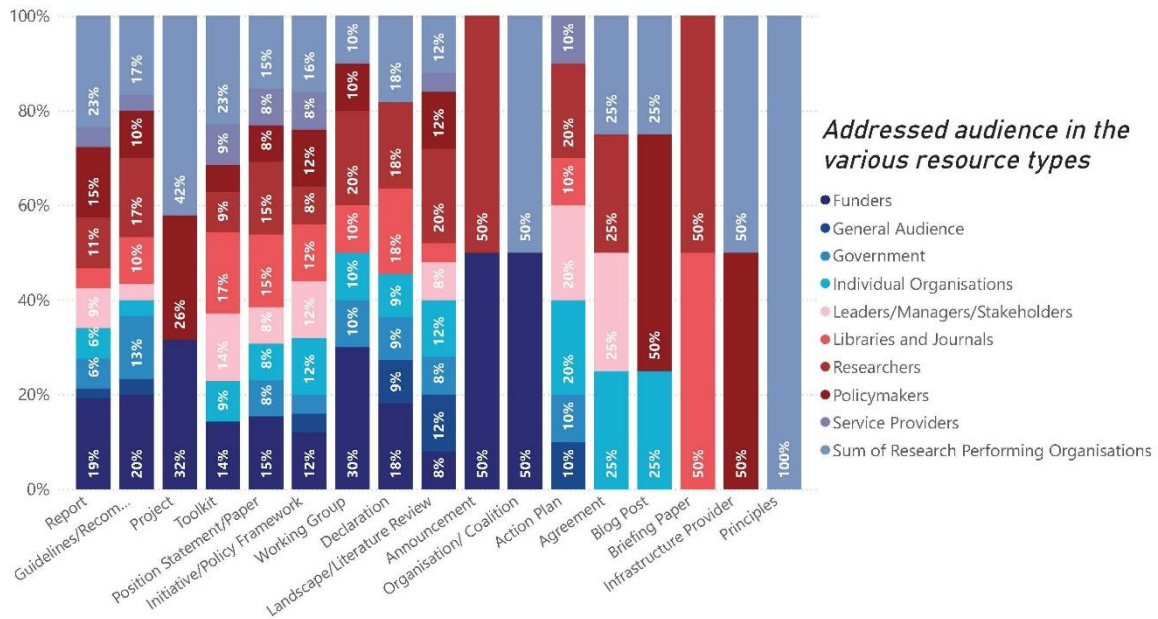


Figure 9: This chart shows the number of addressed audiences across various resource types. Figure created by authors, 2025.

When examining trends over time, RPOs consistently remained the most prominent audience addressed throughout the dataset. This is particularly evident in 2022, when RPOs were identified as the intended audience in 18 separate documents. In more recent years, particularly 2025, there has been a noticeable diversification in audience focus, with documents increasingly addressing multiple or more specific audience types rather than relying on institutional-level targeting alone (Figure 9).

Variation is also evident when comparing intended audiences across resource types. For instance, reports address nearly all ten audience categories, highlighting their broad scope and comprehensive communication style. Conversely, projects tend to focus on a smaller subset of audiences, most notably funders, policymakers, and RPOs, reflecting their operational and policy-driven nature. Similarly, action plans, announcements, and briefing papers primarily target organisations and institutional stakeholders, indicating a more specialised communication intent.

5. Limitations

Several limitations exist, for example, language constraints and a bias toward English-speaking countries such as the United Kingdom, Canada, Australia, the European Union, and the United States. This emerged early in the process, primarily because most accessible resources, toolkits, policies, guidance materials, and discussions of ORP were published in English. As a result, the landscape that could be captured was disproportionately shaped by English-language outputs, limiting the representation of non-English-speaking nations. However, it should be noted that some resources provided broader international coverage, such as the blog *Open Access Policies and Mandates Around the World* (McKenna, 2024), which examines open access policies and mandates from around the world, offering valuable insights into how different regions approach open access globally.

From a topical perspective, the project began with a predefined set of themes aligned with the OR4 project outputs. The team initially anticipated encountering a relatively stable group of topics throughout the review. However, as the work progressed, the range of topics expanded significantly. Numerous themes emerged that had not been expected at the outset, reflecting the diversity and complexity of open research practices across the collected materials. This expansion resulted in a broad array of topics represented in the evaluation and documentation.

During the first round of analysis, approximately 40 distinct topics were identified across the 100 documents reviewed. While this demonstrated the richness of the landscape, it also posed a challenge: many topics appeared only once or twice, creating a fragmented dataset with limited analytical value. Furthermore, several topics were closely related, for example, rewards, benefits, and recognition, yet had been coded separately. To address this, the team undertook a consolidation process to strengthen the coherence and usefulness of the analysis. Related topics were merged into broader thematic categories; for instance, rewards and recognition were combined into a single overarching topic. A legacy dataset containing all individual, unmerged topics has been retained for reference. However, for the purposes of the open research database, only the refined and consolidated set of topics was uploaded. This process resulted in a final model comprising ten overarching topics, providing a clearer and more meaningful framework for interpreting the open research landscape.

For this paper, the research team examined historical records to identify and evaluate the earliest documented examples of OR initiatives/resources, which, as discussed in the results, date back to 2012. As the collection and analysis of OR initiatives and related documents are ongoing, a cut-off date of 31 July 2025 was established. Documents and initiatives published after this date are therefore not included in the present paper. The team would also like to highlight that expanding this work to include resources in additional languages, as well as the continuations of this work, is needed to better understand how the OR and RA landscape is changing.

6. Conclusions

Building on the findings presented above, this landscape review demonstrates how the global OR landscape can be understood through its geographical origins, temporal development, responsiveness to societal challenges, and engagement with key stakeholders.

KO1: The mapping of geographical and institutional origins shows that the contemporary OR ecosystem is shaped predominantly by regional collaborations, particularly within Europe, alongside a smaller but significant number of national and global contributions. Regional-level production represents the largest share of outputs, while nationally produced documents are concentrated in a limited number of countries. At the institutional level, RPOs, funders, coalitions, and policy networks emerge as central drivers. OR is therefore not primarily an individual endeavour, but a coordinated institutional and intergovernmental effort that translates high-level commitments into operational frameworks, guidance, and infrastructure. Notably, although many resources originate at regional or national levels, they are frequently directed toward global audiences, underscoring the increasingly international orientation of OR communication and collaboration.

KO2: Examining how OR documents and initiatives have evolved over time reveals a clear and sustained growth trajectory from 2012 to 2025, with a marked acceleration from 2020 onwards. Early outputs were strongly centred on research evaluation and metrics, reflecting sector-wide debates around impact factors and bibliometrics. Over time, the thematic scope expanded to include FAIR data, reward and recognition systems, responsible research and innovation, narrative CVs, and broader incentive reform. At the same time, the diversification of resource types, from reports to toolkits, projects, agreements, and action plans, signals a shift from conceptual and policy-level discussion toward implementation and culture change. This progression illustrates the maturation of OR from a largely normative agenda to a more embedded and operational framework within research systems.

KO3: The review also shows how OR initiatives have responded to changing research and societal challenges. The surge in documentation during and after the COVID-19 pandemic highlights how global crises can accelerate commitments to transparency, rapid data sharing, and cross-border collaboration. More broadly, the strong presence of RRA across the dataset reflects an ongoing response to concerns about perverse incentives, research integrity, precarity, and inequity within academic systems. Increasingly, OR is framed not merely as a technical enhancement of research workflows but as a structural reform aimed at strengthening trust, accountability, and societal relevance.

KO4: Finally, the analysis of intended audiences reveals how OR initiatives engage with different stakeholder groups. The predominance of RPOs and funders as primary audiences underscores the central role of institutional leadership in embedding openness within research culture. Reports tend to address multiple stakeholder groups, while projects and action plans are more tightly focused on policy and organisational actors. In recent years, there has been growing diversification in audience targeting, suggesting a gradual expansion

beyond institutional decision-makers toward researchers and broader communities. This indicates an emerging recognition that sustainable culture change requires distributed engagement across the entire research ecosystem.

Taken together, these interconnected dimensions, geographical distribution, temporal evolution, societal responsiveness, and stakeholder engagement demonstrate that OR is evolving into a structurally embedded and internationally coordinated movement. Assessment reform, institutional leadership, and global knowledge exchange appear as mutually reinforcing pillars in the development of a more responsible, equitable, and impactful research system

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8. CRediT Authors Contribution

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Felix Pedrotti: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing - original draft, and Writing - review & editing.

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Neil Jacobs: Conceptualization, Data curation, Formal analysis, Methodology, Project administration, Supervision, Writing – original draft and Writing – review & editing.

All authors reviewed and approved all content and take full responsibility for the final paper.

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10. Conflict of Interest Statement

All authors declare no conflict of interest.

11. Abbreviations/Glossary

In this document, some words, e.g., open science and/or open research, open science practices and/or open research practices, have been used throughout the document interchangeably; however, it should be noted that many open research practices have commonly been discussed under the term “open science”, open research applies to all disciplines. Please also refer to the definitions below for the respective terms. The terms are listed in the order in which they appear throughout the document.

- OS - Open Science: An approach to research that promotes transparency, accessibility, and collaboration by openly sharing data, methods, and results.
- OR - Open Research: A broad concept covering practices that make the entire research process more transparent, inclusive, and accessible.
- ORP - Open Research Practice: The practice of conducting and sharing research processes, data, and outputs transparently and accessibly to support collaboration, reproducibility, and wider community engagement.
- RA - Research Assessment: The process of evaluating researchers’ contributions and impact using qualitative and quantitative measures to support fair, transparent, and responsible recognition of their work.
- RRA - Responsible Research Assessment: An approach to fair, transparent, and context-sensitive evaluation of researchers’ contributions using methods that value quality, integrity, and openness rather than relying solely on traditional metrics.
- UNESCO - United Nations Educational, Scientific and Cultural Organisation: A UN agency that promotes international cooperation in education, science, culture, and open science policy.
- cOAlition S - An international consortium of research funders that promotes full and immediate open access to scholarly publications through Plan S.
- National Institutes of Health (NIH) - The primary U.S. government agency responsible for funding and conducting biomedical and public health research.

- National Science Foundation (NSF) - A U.S. federal agency that supports fundamental research and education across science and engineering disciplines.
- DORA - San Francisco Declaration on Research Assessment: A global initiative calling for improved research assessment practices and reduced reliance on journal-based metrics.
- CoARA - Coalition for Advancing Research Assessment: An international coalition working to reform how research, researchers, and RPOs are evaluated.
- UKRI - UK Research and Innovation: The national funding body that supports research and innovation across the United Kingdom.
- RPO - Research Performing Organisation: An institution, such as a university, research institute, or laboratory, that conducts, supports, and manages scientific research as a core part of its mission.
- REF - Research Excellence Framework: The UK system used to assess the quality and societal impact of research in higher education institutions.
- OA - Open Access: A publishing model that allows research outputs to be freely available online without subscription or payment barriers.
- Google - A widely used web search engine that enables the discovery of academic literature and research-related information.
- Bing - A web search engine developed by Microsoft that provides access to online information and research resources.
- URL - Uniform Resource Locator: The web address used to identify and locate a specific resource on the internet.
- FAIR Data - Findable, Accessible, Interoperable, and Reusable Data: A set of principles designed to improve the usability and reuse of research data.
- Metrics - Quantitative indicators, such as citation counts, used to measure research output and influence.
- h-Index - A metric intended to measure both the productivity and citation impact of a researcher's publications.
- Microsoft Excel - A spreadsheet software application commonly used for data organisation, analysis, and basic visualisation.
- Microsoft Power BI - A business analytics tool used to create interactive dashboards and data visualisations.
- COVID-19 - Coronavirus Disease 2019: A global infectious disease caused by the SARS-CoV-2 virus, first identified in late 2019 and declared a pandemic in March 2020. It highlighted the importance of rapid data sharing and open research practices
- RRI - Responsible Research and Innovation: Approach to conducting research in a way that is ethically sound, socially responsible, and aligned with societal

needs through inclusive engagement and careful consideration of potential impacts.

- Narrative CVs - A CV format that allows researchers to describe their contributions, skills, and impact beyond traditional metrics.
- Citizen Science - Research activities that actively involve members of the public in data collection, analysis, or knowledge creation.
- OR4- Open and Responsible Researcher Reward and Recognition: A UKRI-supported project within the Open Research Programme (ORP) aims to reform the ways in which institutions recruit, promote and appraise their staff to better reward open research practices (for more details, see: <https://www.ukrn.org/open-and-responsible-researcher-reward-and-recognition-or4/>).

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