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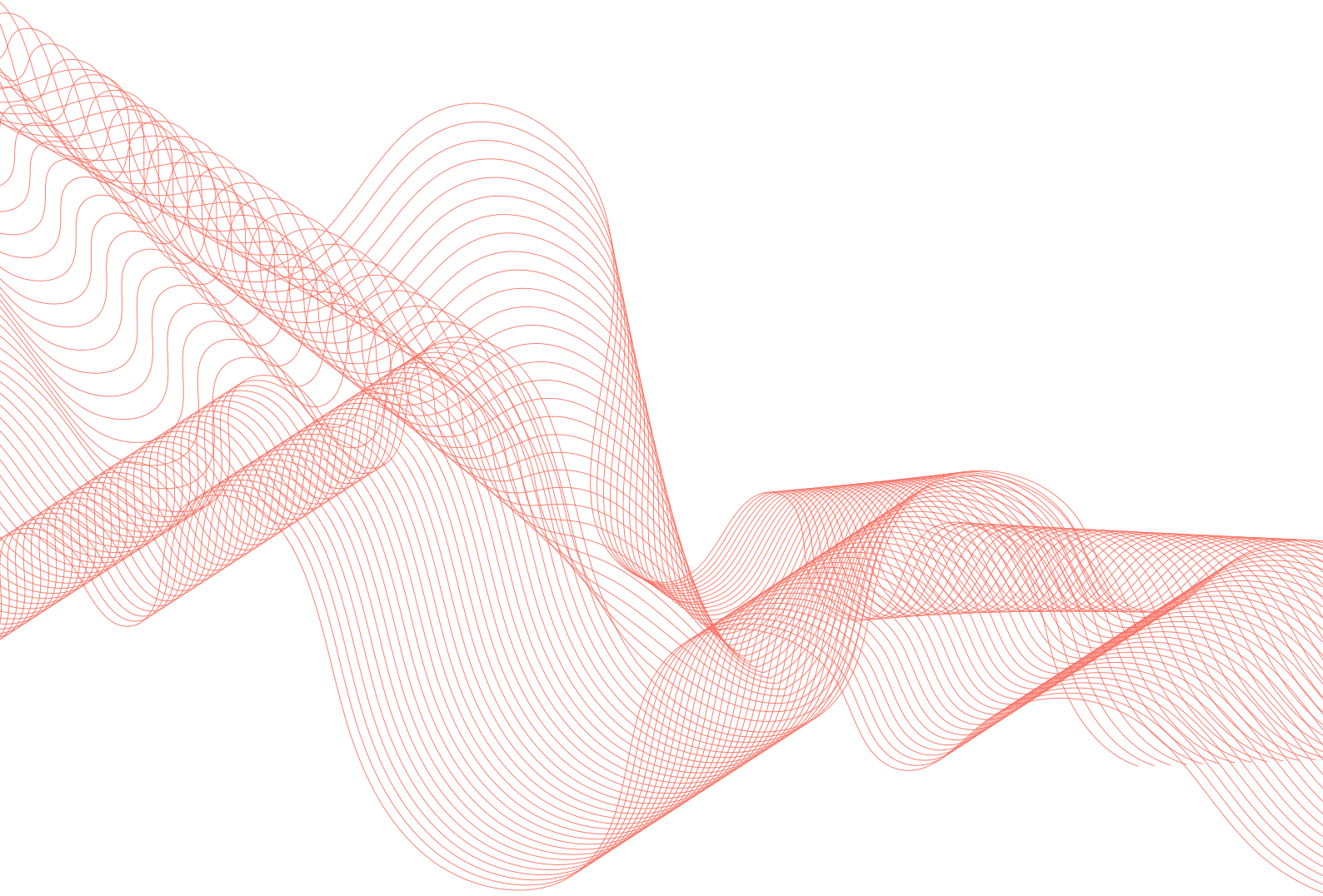
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1 Introduction

The International Observatory on Information and Democracy, a core project of the Forum on Information and Democracy, aims to provide a common and shared understanding of information ecosystems and their impact on democracy.

The Observatory aggregates and synthesizes existing research and available data through a robust, inclusive critical review process. Currently in the form of biennial reports, it provides civil society leaders, researchers, academics and, importantly, policy makers, with a periodic global assessment of the information and communication space and its impact on democracy.

Its work aims to inform the international community's efforts to foster the adoption of effective and proportionate regulatory and non-regulatory measures for the protection of human rights – including the right to reliable information – and democracy in the digital space.

The sections of this appendix outline important aspects of the Observatory's work that led to the production of this report. Section 2 deals with the governance structure and the configuration of the Observatory's work from 2022 to 2025. Section 3 explains the data collection phase and the critical state-of-the-art review methodology, including the criteria for selection and analysis of the literature. Section 4 provides a breakdown of the citations used in the report – what literature is analyzed – and provides an insight into the limitations of the work. Finally, Section 5 details the reasoning for the terminology used in the report, specifically the concepts of 'information ecosystem' and 'public sphere'.

2 The Observatory's Work and Governance

2.1. PREFIGURATION PHASE AND GOVERNANCE STRUCTURE (2022–23)

The **prefiguration group** of the International Observatory on Information and Democracy, composed of recognized personalities from the world of research and international governance (listed below), was tasked to specify the objectives, methodology and means of the Observatory in a report, *Observatory on Information and Democracy – Feasibility study*. The report was presented to the States of the International Partnership for Information and Democracy during the 2022 Summit on Information and Democracy.

Co-Chairs
- Ángel Gurría, former Secretary-General of the OECD
- Shoshana Zuboff, Professor Emeritus, Harvard Business School, author of *The Age of Surveillance Capitalism*

Members
- Virgilio Almeida, Professor Emeritus, Department of Computer Science, Federal University of Minas Gerais (Universidade Federal de Minas Gerais)
- Jim Balsillie, Founder of the Center for International Governance Innovation (CIGI)
- Jean-Marie Guéhenno, diplomat, former United Nations Under-Secretary-General

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- Miguel Poiares Maduro, Chair of the Executive Board, European Digital Media Observatory, European University Institute
- Maria Ressa, Chief Executive Officer of Rappler, Nobel Peace Prize laureate 2021
- Burhan Sönmez, President, PEN International

In May 2023, more than 100 researchers expressed support for the creation of the Observatory and called for all relevant stakeholders to cooperate with it. On the International Day of Democracy, the prefiguration group nominated 19 prominent leaders in policy, research and academia to join the **Steering Committee** for the Observatory's inaugural research cycle. This dynamic group of scholars and thought leaders (listed below) represents diverse geographies and disciplines, encompassing fields as wide-ranging as political science, ethics, journalism, engineering, anthropology, economics and data science. The job of the Steering Committee was to take part in shaping the content and presentation of findings in the report through active feedback on the research method and report drafts.

- Luca Belli, Professor of Digital Governance and Regulation, Fundação Getulio Vargas (FGV) Law School, Rio de Janeiro (Brazil)
- Gustavo Cardoso, Media Sociologist, University Institute of Lisbon (ISCTE-IUL, Instituto Universitário de Lisboa), Director of OberCom (Observatório dos Meios de Comunicação Social) (Media Observatory) (Portugal)
- Niva Elkin-Koren, Professor at Tel-Aviv University Faculty of Law, Faculty Director of the Chief Justice Meir Shamgar Center for Digital Law and Innovation (Israel)
- Helani Galpaya, Chief Executive Officer of LIRNEasia (Sri Lanka)
- Timothy Garton Ash, Professor of European Studies, University of Oxford, Isaiah Berlin Professorial Fellow at St Antony's College, Oxford, (United Kingdom); Senior Fellow at the Hoover Institution, Stanford University (United States)
- Frances Haugen, Co-Founder of Beyond the Screen, algorithmic product expert, advocate for accountability and transparency in social media (United States)
- Jeannette Hofmann, Professor of Internet Politics, Freie Universität Berlin, Research Group Leader at the Berlin Social Science Center; Research Director at the Alexander von Humboldt Institute for Internet and Society (Germany)
- Jhalak Kakkar, Executive Director, Centre for Communication Governance, National Law University Delhi; Visiting Professor, National Law University Delhi (India)
- Ansgar Koene, EY Global AI Ethics and Regulatory Leader (Belgium)
- Admire Mare, Associate Professor and Head of Department, Department of Communication and Media Studies, University of Johannesburg, South Africa (Zimbabwe)
- Nnenna Nwakanma, digital policy, advocacy and cooperation strategist (Ivory Coast)
- Pier Luigi Parcu, Director of the Centre for Media Pluralism and Media Freedom, European University Institute, Director of the Centre for a Digital Society, Robert Schuman Centre (Italy)
- Courtney Radsch, Director of the Center for Journalism and Liberty, Open Markets Institute, Fellow at UCLA Institute for Technology, Law and Policy, Fellow at the Center for Democracy and Technology (United States)
- Jeremy Rifkin, economic and social theorist, bestselling author of 23 books, President of the TIR Consulting Group LLC (United States)
- Ghassan Salamé, former Minister of Culture of Lebanon, Emeritus Professor of International Relations at Sciences Po Paris (Lebanon and France)
- Sonja Solomun, Deputy Director of the Centre for Media, Technology, and Democracy, McGill University (Canada)
- Nicol Turner Lee, Senior Fellow in Governance Studies, Director of the Center for Technology Innovation, Brookings Institution, Washington, DC (United States)

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- Stefaan Verhulst, Research Professor, Center for Urban Science and Progress, Tandon School of Engineering of New York University, Co-Founder of The Governance Laboratory (GovLab) (NYC), Co-Founder of The Data Tank (Brussels)
- Natalia Zuazo, author of *Guerras de internet and Los dueños de internet,* Director of SALTO, UNESCO consultant (Argentina)

In parallel, the Observatory set up its **Stakeholder Advisory Group** (SAG) for consultative purposes. This was organized into three sub-groups representing stakeholders working in the fields of information, communication and democracy:

- States and regulatory bodies (gathering all 52 States of the Partnership for Information and Democracy and regulatory representatives)
- The world of research and advocacy (an extensive network of NGOs and academic representatives)
- Private tech companies (spanning a dozen private tech company representatives, including some very large online platforms, or VLOPs).

The SAG was consulted at key milestones of the research cycle to ensure diverse perspectives. The group made recommendations and shared best practice with the Steering Committee regarding the production of the Observatory's report.

2.2. INAUGURAL RESEARCH CYCLE (2023–25)

After the prefiguration phase that set out the Observatory's objectives, means and methodology, and a thorough consultation process with all relevant stakeholders in the field, the first work cycle was officially launched in October 2023 at the Internet Governance Forum in Kyoto, Japan. During the event, an interactive panel discussion featuring members of the Steering Committee revealed the priority **themes** of the inaugural report: **news media, AI systems** and **data governance.** These were to be dealt with in the context of the challenges of mis- and disinformation for the integrity of public discourse, the fairness of political processes, media freedom and the resilience of public institutions.

The Observatory issued an open call to the SAG and other key contacts to recruit members for three **Research Assessment Panels** (RAPs) that were tasked to aggregate and synthesize state-of-the-art research relating to the three themes (see Sections 3 to 5 for the detailed methodology). The permanent Secretariat of the Observatory selected the panel members based on experience and expertise in the relevant fields, regional expertise and publication records. Special attention was given to ensuring a gender balance and geographical diversity during the selection process. Initially 60 experts and researchers were selected to join the RAPs, with many contributing throughout (see the Acknowledgments).

In addition, a **scientific director,** a lead rapporteur, and two rapporteurs for each RAP were appointed to draft the report. **Robin Mansell,** Professor Emerita, Department of Media and Communications, London School of Economics and Political Science (LSE), was appointed as the Observatory's Scientific Director, and Professor **Rob Procter,** University of Warwick and The Alan Turing Institute, was named as the Lead Rapporteur.

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3 Research Themes and Methods

3.1. OVERVIEW AND RESEARCH GOAL

Rather than undertaking original research, the Observatory's mandate is to conduct a critical synthesis of state-of-the-art research. As such, the report synthesizes existing evidence based on a critical review of the literature informed by expert consultations. The aggregation and synthesis of research and available data proceeded under the supervision of the Observatory's Steering Committee chaired by Courtney Radsch, Director of the Center for Journalism and Liberty, Open Markets Institute, and 18 other renowned international experts in the field.

The report summarizes existing research and significant gaps in the evidence base, identifying priorities for future research. In this effort, the Observatory especially looked to source input from the Global Majority World – albeit acknowledging and reflecting on the gross imbalance in resources available to conduct and publish research between the Global North and the Global Majority World. The report presents the key findings and actionable insights, highlighting the main differences in information ecosystems around the world and how people engage with them, based on research drawing on a wide variety of theories and research methods.

3.2. A THEME-CENTERED APPROACH

The work of the Observatory was conducted around three guiding themes: **media, politics and trust; artificial intelligence, information ecosystems and democracy; and data governance and democracy.** Theme rapporteurs and RAP contributors examined evidence relevant to the themes with a cross-cutting focus on mis- and disinformation and a particular interest in their intersection with democratic attributes. In doing so, they focused on key aspects such as the integrity of public discourse, the fairness of political processes, media freedom and the resilience of public institutions.

Each theme was addressed using a set of guiding questions and objectives set by the Steering Committee with two main goals: (i) mapping research and policy, synthesizing the strengths and weaknesses of the evidence; and (ii) recommending new lines of research and potential governance responses (formal policy/regulatory, multilateral, multistakeholder, etc.). This research exercise was not intended to provide specific recommendations for policy action.

A brief overview of each theme follows.

Media, politics and trust

This theme addressed the pressures, adaptations and impacts on reporting local, national, regional and international news, business models for the remuneration of journalism, the political implications of online mis- and disinformation for democracy in the longer term, and the impacts of mis- and disinformation on trust in science, experts and the media in a 'post-truth' era.

Objectives:
- To understand the changing role of legacy and newer news media in democratic processes, including journalist reporting and trust in media sources.
- To assess the causes and consequences of changes in news media practice for democracy and the reasons for declining trust.

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Artificial intelligence, information ecosystems and democracy

This theme addressed the use of AI systems in content moderation and personalization systems in information ecosystems, their use in legacy and news media production, and the implications for the protection of fundamental rights and for the fabric of democratic societies, including values, structures, and processes resulting from changes in global communication flows and information quality. It also addressed the need for people to acquire skills to help them manage their consumption of content encountered within information ecosystems, and to participate in debates about AI applications that affect their working and everyday lives.

Objectives:
- To understand the role of AI systems development in information ecosystems.
- To assess the causes and consequences of AI systems for democracy, including the broader implications of the role of AI systems in information ecosystems for democratic processes, societal resilience and cohesion, including democratic values.

Data governance and democracy

This theme focused on artificial intelligence as an anti-democratic economic phenomenon and anti-democratic epistemic form. It critically examined the discourses and strategies deployed by big tech companies to promote their 'AI' solutions in ways that mystify what AI is and can do, creating dependence through the exercise of corporate power and curtailing opportunities for uses of AI consistent with healthy, inclusive, fair and just democracies. It also focused on how data governance approaches developed in and by actors in the Global North are exported and resisted by actors in the Global Majority World.

Objectives:
- To understand the role of data governance and its implications for fundamental human rights and democracy.
- To assess the impact of approaches to data governance, including the broader implications for democratic processes, practices and inclusive participation.

Cross-cutting theme: mis- and disinformation

This theme aimed to elicit an insight into the problems for democracy created by the production, circulation and consumption of information that qualifies under definitions of 'misinformation' and 'disinformation' by undertaking a critical analysis across the three themes. It recognized that the deployment of AI systems is reshaping the public sphere and the processes and practices of democracy, with implications for inclusive and equitable participation in society in the Global North and Global Majority World.

Objectives:
- To understand the role of mis- and disinformation in information ecosystems and its implications for democracy.
- To assess the causes and consequences of mis- and disinformation for democracy, including the broader implications for democratic processes, practices and participation.

3.3. DATA COLLECTION AND ANALYSIS

The research assessment in this report can be characterized as a critical review of state-of-the-art research. The strength of our review is our effort to critically evaluate the quality of cited works, and at the same time, our examination of relatively current research and commentary. Undertaking a formal systematic review following standards such as the Cochrane methodology was outside the scope of the project. Thus, we did not undertake a quantitative meta-analysis of the research collected for this report.[1] Here, we provide an overview of the key steps in our review.

[1] Grant & Booth (2009), for systematic literature reviews, and Higgins *et al.* (2024), for guidance on a formal Cochrane protocol review.

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First, the Scientific Director – together with the Lead Rapporteur and the rapporteurs – compiled and discussed keywords,[2] which they used to search bibliographic databases and a variety of web-based sources, starting the search in October 2023 with additions made until October 2024.[3] In addition, the Scientific Director searched titles and abstracts of papers in issues of 52 journals published between 2022 and December 2023, including journals in the social sciences and computer science.[4] Additional Google Scholar, Web of Science and Scopus searches were conducted when the Steering Committee suggested sub-topics that should be explored – keywords in these cases were specific to the topic, for example zero rating, news deserts and digital divide. Earlier publications (before 2020) were included when it was appropriate to provide background or historical context.

Second, individuals or groups of two or three RAP contributors and the rapporteurs for each theme conducted additional searches guided by the objectives (see Section 3.2) and the research question (a selection of these is indicated at the start of Chapters 2–8 and in Chapter 9). The guidance issued to RAPs for the selection of sources is indicated below.

Third, two global calls for contributions were launched to gather further sources. The focus was to gather material especially concerning the Global Majority World to enhance the diversity of our citations database.[5] The Observatory's team and rapporteurs also proactively reached out to experts based in the Global Majority World to identify further relevant sources, with the rapporteurs conducting selected interviews.

Selection criteria

Relevance: Relevance of sources to the themes.
Publication date: Publication date emphasized during the search process was from 2022 to October 2024 to capture recent work but earlier sources were included as appropriate.
Country focus: Global Majority World, Global North, with countries/regions specified as needed, and Global, work with global reach.
Document type: PhD theses/dissertations, academic peer-reviewed articles, academic books and book chapters (some books by non-academic authors active in industry), research reports, policy reports, conference papers and proceedings, pre-prints, and other (magazine and newspaper articles, blogs).

[2] Among the keywords searched were: AI, content generation, content governance, content moderation, mediated misinformation, AI literacy, algorithmic transparency, fairness, information behavior, algorithmic bias, democratic institution, machine learning, news personalization, recommender systems, public trust, public sphere, electoral process, algorithmic accountability, AI ethics, deepfake, news media, traditional media, legacy media, digital media, alternative media, public service media, commercial media, digital platform, social media platform, community media, media ecosystem, trust in news, media consumption habits, news avoidance, media diet, journalists, local, regional, national news, monopoly, competition, data governance, epistemic, human rights. These search terms were combined with information ecosystem, information integrity, misinformation, disinformation, malinformation, hate speech, in varying combinations.

[3] Among the online repositories searched were: AAAI/ACM Conference on AI, Ethics, and Society, AAAI Conference on Artificial Intelligence, ACM Conference on Fairness, Accountability, and Transparency, ACM Conference on Human Factors in Computing Systems, ACM SIGIR International Conference on the Theory of Information Retrieval, Annual Meeting of the Association for Computational Linguistics, European Data Journalism Conference, European Conference on Data and Computational Journalism, IEEE Conference on Artificial Intelligence, International Conference on AI-generated Content, ACM International Conference on Multimedia, International Conference on System Sciences, ArXiv and SSRN Scholarly Papers.

[4] A search on the indexes of the following journal titles and abstracts was performed using information ecosystem, misinformation and disinformation, information integrity, malinformation, hate speech, democracy, algorithm, regulation, and governance, in varying combinations, but excluding Covid-19-related papers: *ACM Computing Surveys, The African Journal of Information and Communication, Artificial Intelligence, Artificial Intelligence and Law, Artificial Intelligence Review, Asian Journal of Communication, Asian Journal of Information Technology, Berkeley Technology Law Journal, Big Data & Society, Big Data Mining and Analytics, Chinese Journal of Communication, Computer Law & Security Review, Digital Communication and Networks, Digital Journalism, Electronic Journal of Information Systems in Developing Countries, Energy and AI, European Journal of Communication, Foundations and Trends® in Machine Learning, Frontiers in Big Data, Harvard Journal of Law & Technology, Human-Computer Interaction, Information, Communication & Society, Information Development, Information Systems Journal, Innovation and Development, International Data Privacy Law, International Journal of Communication, International Journal of Information Communication Technologies and Human Development, International Journal of Information Management, The International Journal of Press/Politics, International Review of Law, Computers & Technology, Internet Policy Review, Journal of Computer Mediated Communication, Journal of Digital Technologies and Law, Journal of Interactive Advertising, Journal of Law & Innovation, Journal of the ACM, Journalism & Mass Communication Quarterly, Journalism Studies, Knowledge-Based Systems, Law, Innovation and Technology, Media, Culture & Society, New Media & Society, Political Communication, Public Opinion Quarterly, Social Media + Society, Social Science Computer Review, South African Journal of Information Management, Stanford Technology Law Review, Telematics and Informatics, The Information Society.*

[5] It is likely that many of the academic sources in our database were written by Global Majority World scholars who were either trained or work and live in the Global North, but this was not checked systematically.

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Language: English (a small selection of French, German, Italian, Portuguese and Spanish).
Type of studies: Studies that use: (i) well-established (qualitative or quantitative) social science methodology and rely on original research or secondary analysis to make an empirical or theoretical contribution to the themes; and (ii) policy reports or other types of contributions published by reputable organizations that may not adopt a clear methodology or rely on primary data, but that identify unique trends relevant to the themes.

Contributions spanning different fields of expertise and regions were assembled using Zotero's open-source bibliographic software, with a total of **3,095 sources** collected by October 2024. Sources were downloaded to Zotero and/or linked by URL. All entries in the full database were reviewed by at least one relevant rapporteur or by the Scientific Director to decide on inclusion in the report. All sources selected for inclusion were reviewed throughout the drafting process by at least two members of the drafting team, usually one rapporteur and the Scientific Director. Cited sources not available on open access were sourced through university library accounts, via drafting team book collections and, in a few instances, purchased.

Rapporteurs reviewed each entry for its type (peer-reviewed article, book, book chapter, report, other material); whether it was public or private (confidential); its origin (authorship, country or public/private organizations); and where indicated, its financial support (this was noted for national/regional research funding bodies, corporate and direct government funding, and public and private organization support; university financial support was not recorded). Most sources were in English, but a few entries were in French, German, Italian, Portuguese and Spanish, with some text translated using online support and own translations.[6]

All citations were checked for quality (see Table A1) in order to (i) maximize the use of independent research sources in the review; and (ii) note sources where funding was declared in footnotes. Importantly, sources characterized as 'low' quality were not automatically excluded, but rather assessed in the light of differences in the availability of independent funding in different countries.[7] The RAP members then synthesized the source evidence for the rapporteurs, sometimes drafting directly text for potential inclusion in the report. Sources were assessed for the novelty of insights and their robustness in view of their provenance. (See Section 4 for details of the final collection of cited sources.)

The report team and the Observatory's office team met weekly to review progress. Two drafts of the report were presented to the Steering Committee and to the SAG for their feedback, which was then integrated into a final draft that was submitted for approval to the Steering Committee. These drafts were also reviewed by RAP members.

Despite gaps in evidence and uncertainties – some due to real-world differences in the experience of information ecosystems, others to diverse theories and methods – this critical review of state-of-the-art research provides an insight into evolving information ecosystems standards, conventions, best practice and changes in the public sphere.

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[6] Translations of portions of the texts in German, Portuguese and Spanish were performed by Google Translate; French language reading proficiency was excellent or good.

[7] In certain countries, funding for research on information systems is often granted mainly by the government or a private foundation in the absence of other sources. In these cases, the quality of the research was assessed carefully in light of the country context by the rapporteurs and RAP members.

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Table A1
Definitions of source quality

Quality	Definition	Funding
High	Paper published in high-quality, peer-reviewed journal or conference.	Independent.
	Book/report published by internationally recognized publisher or organization.	
	Book/report written by internationally recognized author(s).	
	Book chapter written by internationally recognized author(s).	
Medium	Paper published in peer-reviewed journal or conference.	Independent or not declared.
	Book/report published by less well-known publisher or organization.	Independent.
	Book chapter written by less well-known author(s).	
	Report.	Sponsored (government organization; intergovernmental organization; civil society organization).
Low	Report.	Sponsored (private company; private sector association).
	Report.	Not declared.
	Blog, newspaper or magazine article.	–

Note: Classification as 'low' or 'medium' did not mean automatic exclusion. Instead, these labels triggered further review of the source and a judgment about whether and in what context a source should be cited.

4 Characteristics of the Cited Sources

The sources were collected in Zotero. The evidence base contains 3,095 entries, of which 1,664 sources are cited in this report. Of these, 97% were published after 2000 and 90% after 2015. Figures A1 to A3 provide data on the number and share of citations in the report by publication year.

Figure A1
Number of citations in the report by publication year (N = 1,664)
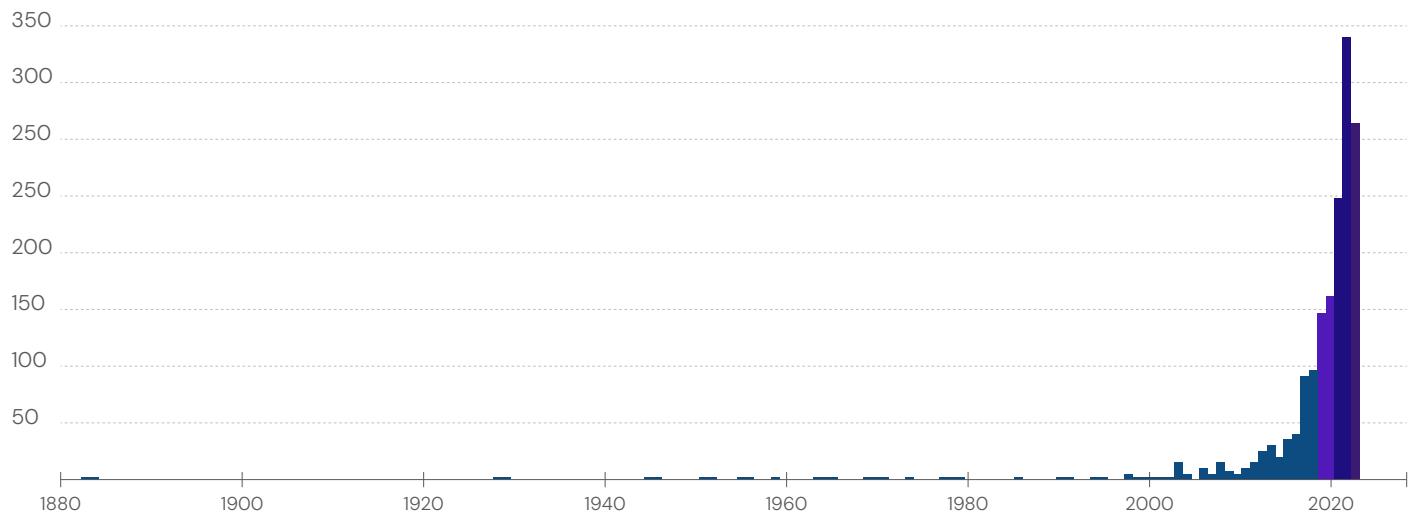
Note: The gradient colors in the chart represent the number of cited publications in each year. The year with the highest number of cited publications is in dark purple, the year with the lowest number is in blue, and bars in between are shaded from the lowest number - light blue to highest number – darkest purple.

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Figure A2
Number of citations in the report
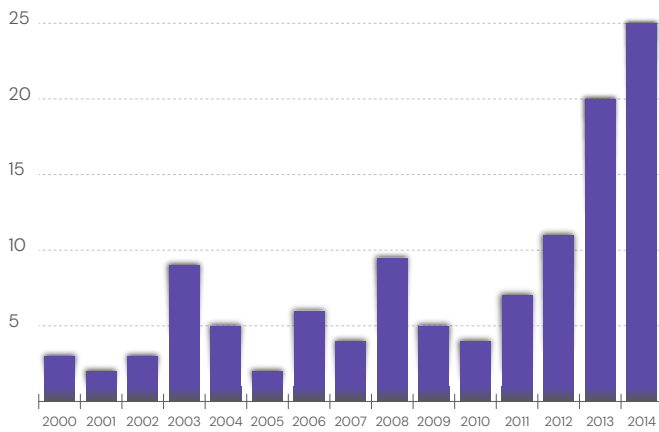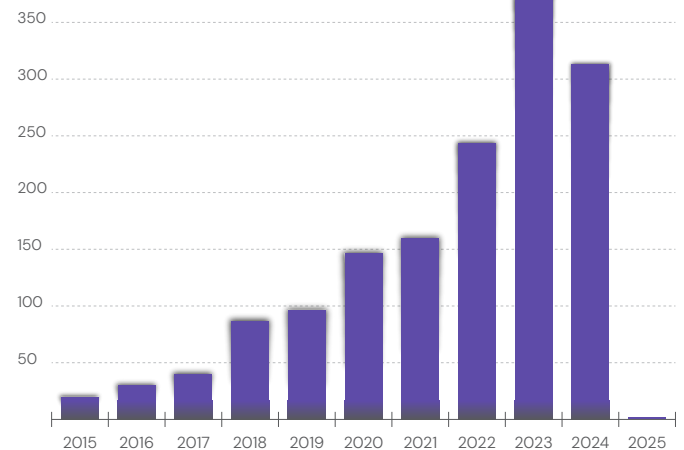by publication year (2000–2014, N = 110)

Figure A3
Number of citations in the report by
publication year (2015–2024, N = 1,508)

Of the cited sources, journal articles were the most common publication type, followed by reports, and then books: 43% of all the 1,664 citations were peer-reviewed articles, 20% were books and book chapters, 18% were reports, and 18% were 'other materials', including conference papers, newspaper and magazine articles, and blog posts. A decision was taken to target the collection of sources principally from 2022 to 2024 due to the volume of sources available over a longer time period and the Observatory's emphasis on current information ecosystems issues. This means that the sources were more diverse in recent years, especially after 2015. Figures A4 to A7 show these distributions.

Figure A4
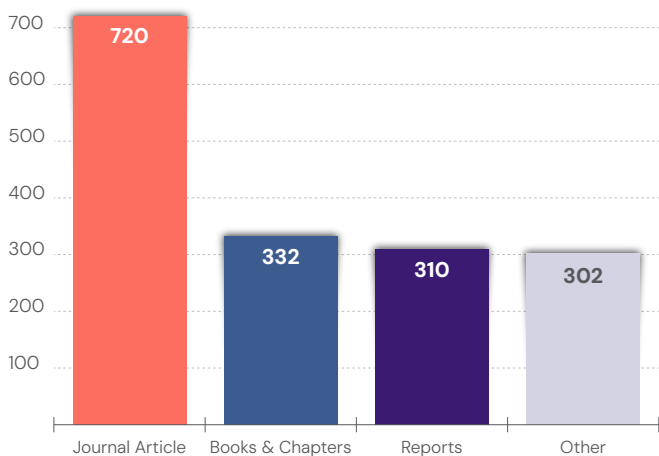Most common publication types
(N=1,664)

Figure A5
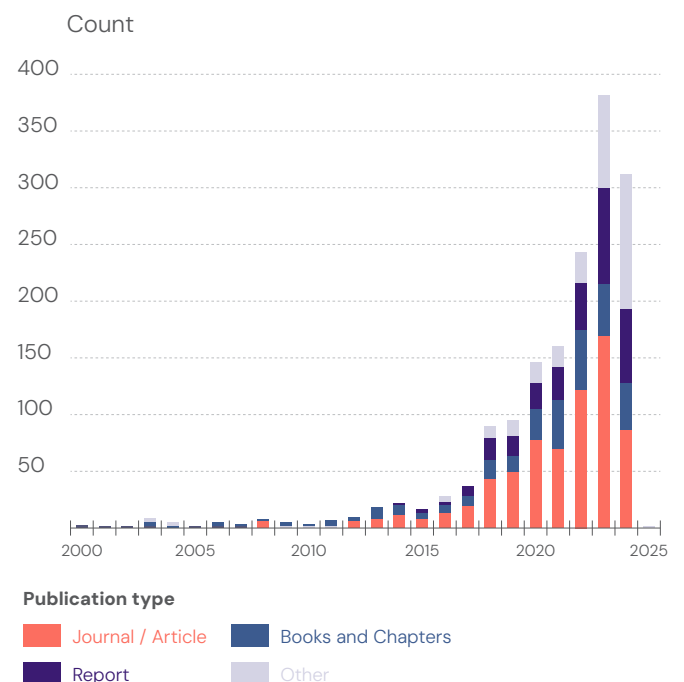Number of publication types by year,
2000–2024 (N = 1,618)

Publication type

■ Journal / Article   ■ Books and Chapters
■ Report   ■ Other

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Figure A6
Types by year, bar chart, 2000–2024
(N = 1,618)

Proportion (%)

Publication type
- Journal / Article
- Books and Chapters
- Report
- Other
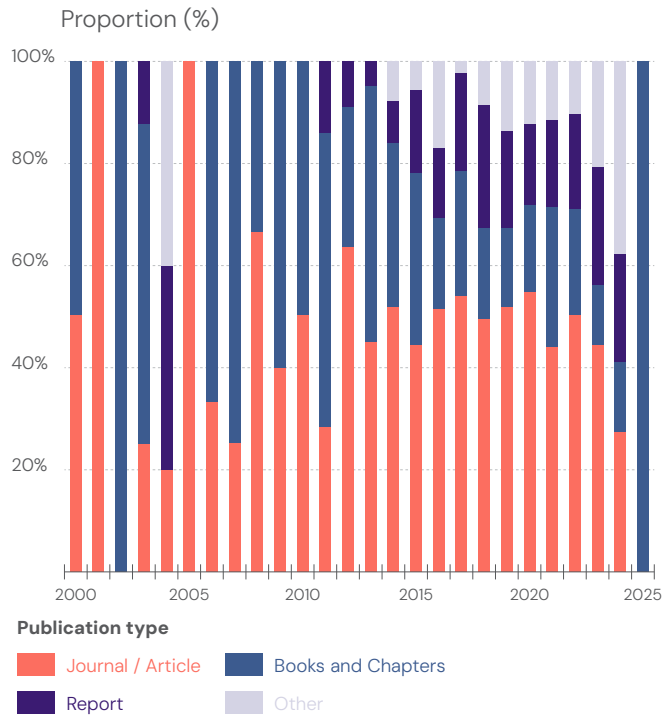
Figure A7
Types by year, cumulative, 2000–2024
(N = 1,618)

Proportion (%)

Publication type
- Journal / Article
- Books and Chapters
- Report
- Other
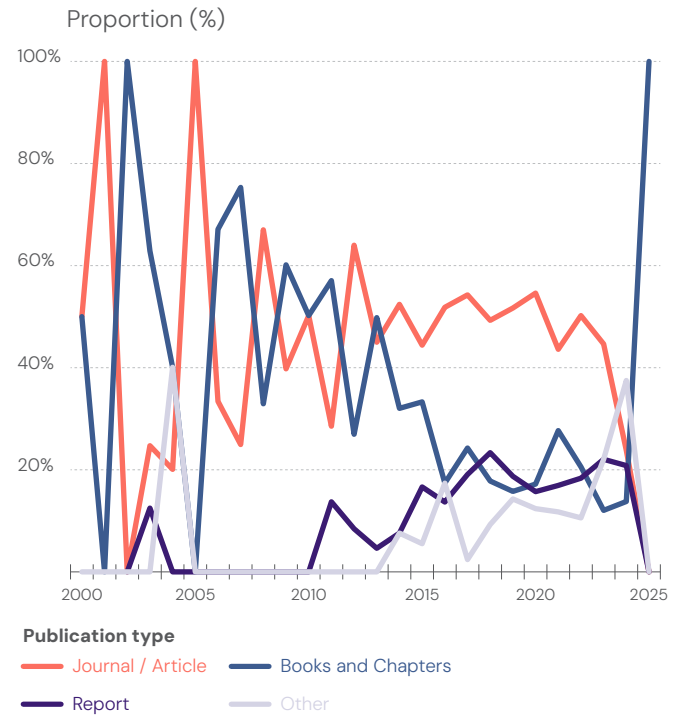
A regional breakdown of the cited sources shows that they are skewed towards literature from the Global North, making up 65.5% (N=1,664). Despite our effort to address this imbalance (see Section 2.2), and several interviews with experts in the Global Majority World, only 22.5% are either about the Global Majority World or by authors from the Global Majority World. The remaining 12% are classified as Global – meaning that they draw on arguments or evidence from a reasonably large number of countries in both the Global North and Global Majority World.

The proportion of Global Majority World citations in the report increased from May 2023 (the first draft report stage) to October 2024, when the source collection process was closed (15% in May 2024 to 22.5% in October 2024). This signals the structural bias of research towards the Global North, and it means that the evidence in this report relies disproportionately on Global North sources. The absence of a robust range of perspectives reflecting the experience of information ecosystems in the Global Majority World is noted throughout the report. Figures A8 to A10 visualize the distribution of sources cited in the report.

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Figure A8
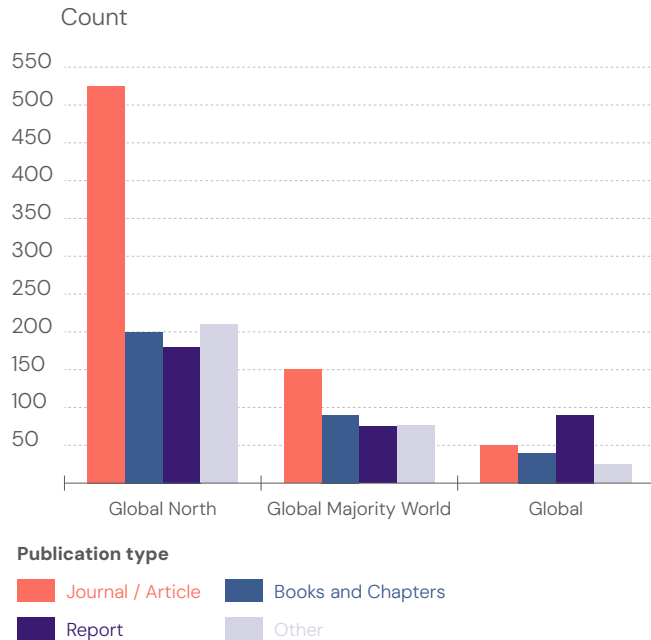Number of types of publications, by regional focus (N = 1,664)

Figure A9
Share of types of publications, by regional focus (N = 1,664)
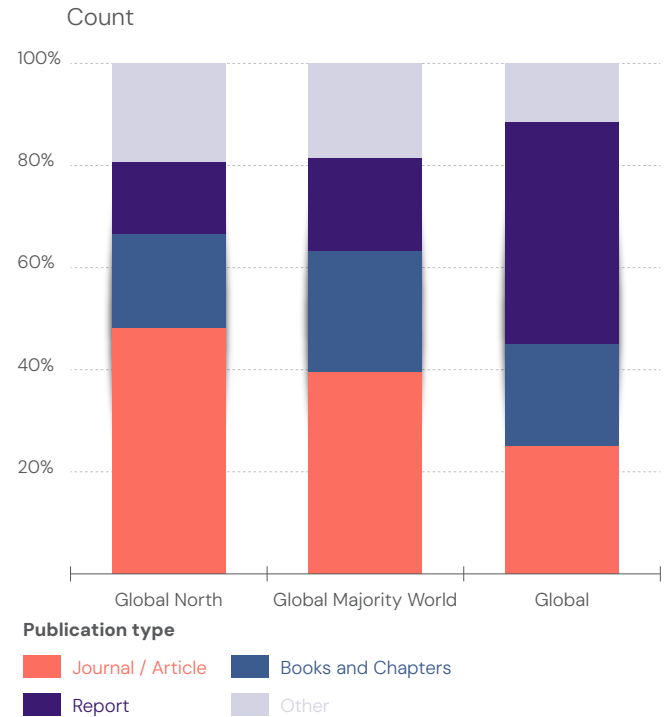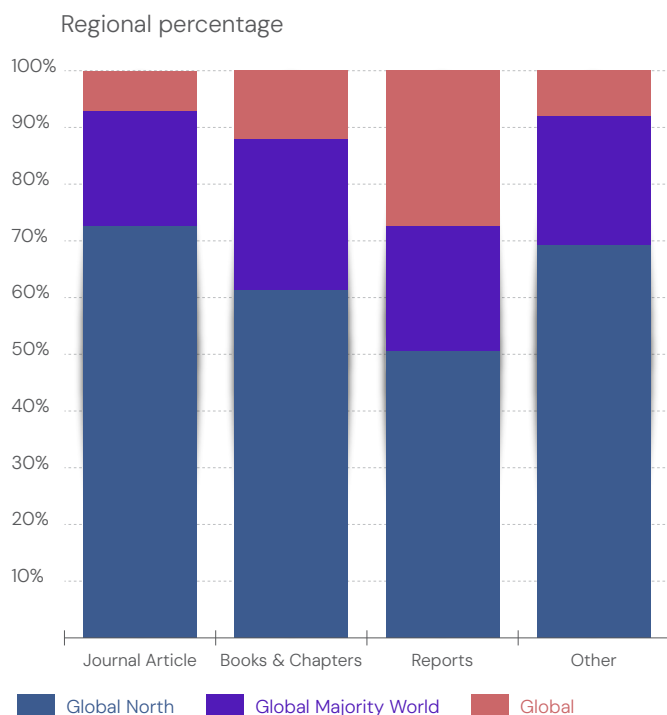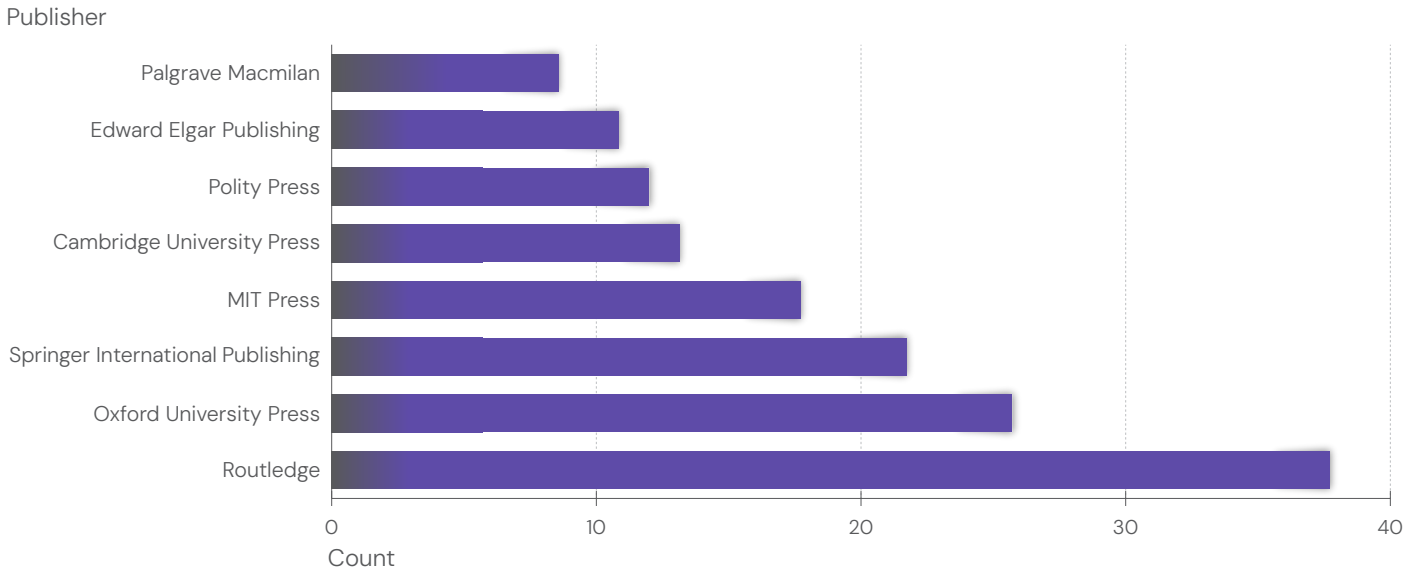

Figure A10
Share of types of cited publications by regional focus (N=1,664)

The publishers of books and book chapters came from diverse sources, most of which are based in the United States, the United Kingdom or Western Europe and often affiliated with academic institutions (e.g., Stanford University, Duke University, University of Amsterdam). In total, we cite 332 books and book chapters from 133 different publishing companies. International academic publishing companies were the most frequently cited (see Figure 11), with the top 20 publishers accounting for 14% of all cited sources (N=1,664) and 37% of all books and book chapters (N=332). Among these, Routledge, Oxford University Press, Springer International Publishing were the predominant publishers, accounting for 10%, 8% and 6%, respectively, of the 332 cited books and book chapters.
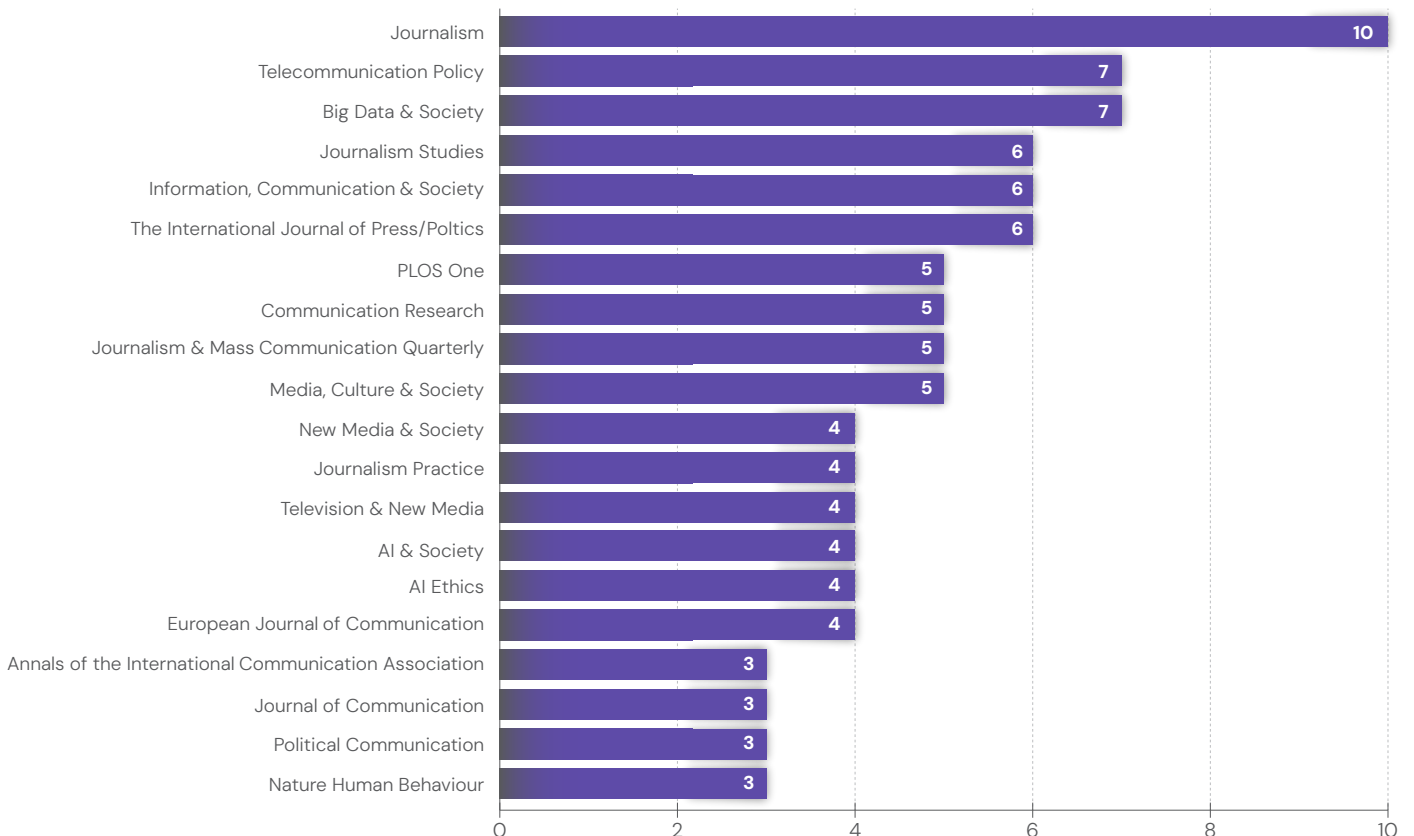
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Figure A11
Number of books and book chapters by most frequently occurring publishing company

Publisher

Finally, the report cites a total of 712 articles from 132 different journals. Among these, the most cited were in the media, journalism and communications fields, with *Journalism, Telecommunications Policy* and *Big Data & Society* being the most commonly cited. Figure A12 provides a summary.

Figure A12
Most frequently cited journals in the report

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5 Concepts and Definitions

The terminology used in this report was informed by scholarly considerations, with the aim of making the report visible in policy communities. We used the terms 'information ecosystems' and 'healthy information ecosystems' as well as 'public sphere', and this section discusses some of the considerations that led to these choices.

In the late 1990s, information 'ecologies' were defined in the scholarly literature as systems of 'people, practices, values, and technologies in a particular local environment'.[8] Research on the 'health' of information 'ecologies' was undertaken focusing on relationships among people, information and technology in contexts such as libraries and other local communities. In this context, health was examined in relation to values and how these changed with the priorities of specific stakeholders. A 'healthy information ecosystem' has been defined more recently as a 'balanced and well-functioning system of information creation, exchange, flow and utilization', with components organized in non-hierarchical and non-linear ways. Building partly on the tradition of 'ecology' and 'ecosystem' studies, this approach puts the 'media system' at the center and locates practices such as content labeling and classification, data, content moderation, authentication, digital platforms and business models as well as data, AI systems including machine learning on the infrastructure layer of an information ecosystem.[9] Additionally, the 'health' of 'information ecosystems' has been investigated, with 'ecosystem' defined as 'a complex network or system of interacting organisms and their physical environment. An ecosystem is similarly characterized by 'the interdependent relationships among its components',[10] and an effort is made to include cultural, social, political and technological components. This work has focused on 'healthy values', for example diversity, equity, inclusion and accessibility, and is often framed by strands of complex systems theory. In this context, information ecosystems are understood as evolutionary, indeterminate and self-organizing. If power asymmetries among actors in the ecosystem are mentioned, this is typically undertheorized due to the emphasis on the indeterminant, that is, unpredictable, system changes.

'Information ecosystems' terminology is increasingly present in policy documents and in a variety of research traditions.[11] In other research traditions, however, this metaphor is strongly criticized. It is said, for example, to obfuscate the requirements for democratic governance because it serves as 'a means of justification and legitimacy under contemporary neoliberalized orders that typically chafe at modes of public intervention and the language of democratic statecraft'.[12] In this sense it is argued that the metaphor distracts attention from investigation of whose interests are served by big tech company actions, and 'by whom, and by what right, can someone be excluded from public conversation?'[13] Further, it is argued that it makes no distinction 'between trolling, intent to harm, and justified outrage'.[14] The metaphor of an ecosystem is understood by some critics to de-emphasize human agency because 'system' concepts are assumed to operate like natural systems.

[8] Nardi & O'Day (1999, p. 49).

[9] Radsch (2023e, p. 2-3).

[10] Introne *et al.* (2024, p. 1030).

[11] This metaphor has been used recently by the Center for Democracy and Technology (CDT), US, International Federation of Library Associations and Institutions (IFLA), Open Knowledge Foundation, Centre for Media Pluralism and Freedom (CMPF), Research ICT Africa (RIA), United Nations (UN), United Nations High Commissioner for Refugees (UNHCR), Organisation for Economic Co-operation and Development (OECD), Partnership on AI, as well as numerous law firms, plus Meta/Facebook among other companies. 'Information ecosystem' in the scholarly literature appears infrequently up to 1990, except in relation to the environment and education. From 1990-2000 it appears in relation to multimedia; from 2000-10 it is mainly used in relation to mobile communication and 4G, in business studies and in relation to the World Wide Web and multimodal communication. From 2010-20, it is present in relation to 5G, media and media convergence, social media and journalism, as well as media literacy and technology. Most recently, it appears in relation to medical health and the Covid-19 pandemic, government uses of digital systems, AI systems, 'fake news', social media and echo chambers. As of October 2024, Google Scholar has yielded about 14,200 entries for 'information ecosystem' and 3,580 for 'information ecosystems'. 'Healthy information ecosystems' appears 43 times and 125 times for 'healthy information ecosystem'. Most occurrences are in papers from the Global North, but also in publications in the Global Majority World. The metaphor of an ecology or ecosystem of media or communication is used extensively in the scholarly literature in the social sciences and sciences, but this string was not reviewed.

[12] Gibson *et al.* (2023, p.2). One author was a senior researcher at Microsoft Research.

[13] Gibson *et al.* (2023, p. 11).

[14] Rieder & Skop (2021, p. 12), supported by the German Research Foundation (DFG, Deutsche Forschungsgemeinschaft).

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Complex systems theory is said to neglect 'deliberative conversations and subaltern counterpublics'.[15] The phrase 'healthy information ecosystem' is also said to serve as 'a useful tactic for journalists and policymakers, who do not recognize or may wish to cloak their own normative position'.[16] For all these reasons, the healthy information ecosystems metaphor is positioned as serving the interests of big tech companies, shielding them from responsibility for creating problems.[17]

In some of the literature on information ecosystems the historical specificity and the role of imaginaries in structuring the public sphere is neglected.[18] In this context, many scholars prefer to focus on the 'public sphere', a sphere or space in which, ideally, public deliberation can proceed rationally.[19] This concept is also subject to criticism in some research traditions for its assumptions about the existence of 'critical-rational publics'.[20] The public sphere concept is criticized for its assumptions about liberalism and illiberalism,[21] and its emphasis on ideal speech conditions and rational communicative action. Historical and contemporary exclusions and marginalizations from the public sphere are neglected in some writing about the role of the public sphere in society.[22] The concept is also said to neglect the importance of distinguishing between the normative conditions for a democratic polity where participants struggle to secure the rights to which they are entitled, and the Eurocentricity of the 'public sphere' concept is criticized often, but not exclusively, by scholars in the Global Majority World.[23] The concept is criticized for neglecting the conflictual nature of political discourse and the role of emotions in debate in the public sphere.[24] Finally, less attention tends to be given to structural power, ideology and cultural specificity in studies of the public sphere than is the case, for example, in studies that aim to explain how power asymmetries are embedded and maintained in information and communication systems.

In this report, we use the 'information ecosystems' terminology but do not conceive of their health as a pathology in the medical sense. Where the health of information ecosystems is discussed, it is in relation to normative choices about values; specifically, those enshrined in international human rights commitments and in relation to private and public institutional capacities to uphold those values.

The metaphor of an 'information ecosystem' does tend in much of the literature to be only loosely coupled with values-based considerations and with power dynamics that may have uncertain outcomes, but which also constrain actions to reduce power asymmetries in the short and medium term. For this reason, we draw on theories in the political economy tradition, but not to suggest that political economy structures are determining of certain outcomes. Instead we draw on these theories to assess the scope for the exercise of counter-power and individual and collective agency.

We also focus on the 'public sphere' to center communicative practices that are associated with contemporary problems facing democracy at the core of our analysis.[25] We position the 'public sphere' centrally in our conception of information ecosystems because:

[15] Ehrenfeld (2020, p. 308); Mouffe (1966).

[16] Gibson *et al.* (2023, p. 12).

[17] Gibson *et al.* (2023, p. 10); Ehrenfeld (2020, p. 308).

[18] Ehrenfeld (2020). The 'public sphere' appears throughout the academic literature, although less frequently in policy studies (apart from media and political science studies). As of October 2024, Google Scholar reported approximately 1.8 million mentions, 17,700 since the beginning of 2024, with plural usage 'spheres' occurring 130,000 times. The concept 'public sphere' appears, e.g., in relation to sphericules, postmodernism, the post-public sphere, citizenship and democracy, modernity, deliberation, culture, radicalization and the internet.

[19] Habermas (2015), first published in English in 1989, in German in 1962; Habermas (2022); see also Fraser (1992).

[20] Gerbaudo (2022).

[21] Štětka & Mihelj (2024a, p. 31).

[22] Dahlberg (2014); Devenney (2009); Habermas (2022).

[23] See Banaji (2024); de Sousa Santos (2018).

[24] Cammaerts (2024, p. 27).

[25] Cammaerts (2024); Splichal (2022b, p. 213).

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> Without a model of relationality that attunes us to the historically distinct nature of the public sphere, we lack the means to reflect about how our own acts might contribute to the reinforcement of new forms of solidarity, new forms of intimacy, new forms of collective action, and new forms of identification – in short, new forms of being "public" with strangers.[26]

On both the individual and institutional levels of analysis a key interest in this research assessment is with power relationships and struggles among actors over the design and operation of 'information ecosystems' and the characteristics of the spaces they create for public dialogue.

[26] Ehrenfeld (2020, p. 308).