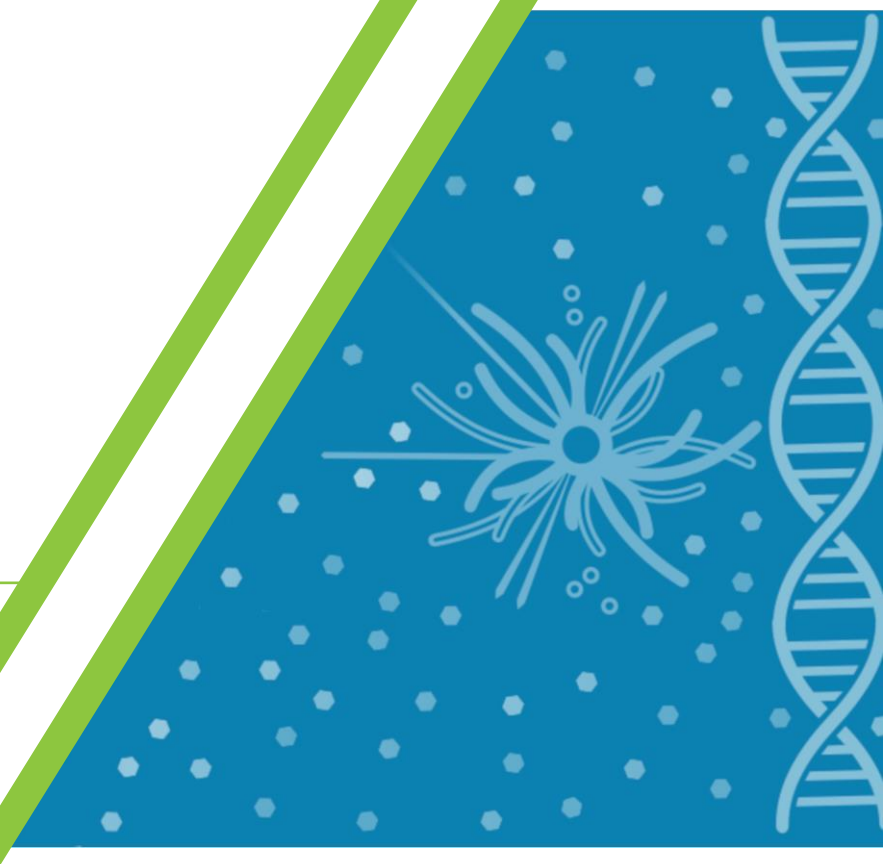
Recommendation of the Council concerning Access to Research Data from Public Funding



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Background Information

The Recommendation concerning Access to Research Data from Public Funding was originally adopted by the OECD Council on 14 December 2006 ("2006 version of the Recommendation") on the proposal of the Committee for Scientific and Technological Policy (CSTP). In view of technological and policy advances in the years following its adoption, the Recommendation was revised by the Council on 20 January 2021. The 2021 revision reaffirmed the relevance and importance of the principles set out in the 2006 version of the Recommendation, while expanding the scope to cover not only research data from public funding, but also other research-relevant digital objects, such as metadata and bespoke algorithms, workflows, models, and software (including code), and going on to provide updated policy guidance structured around seven key policy areas that have emerged as crucial to enhancing access to research data since its adoption.

The Recommendation seeks to assist governments, research support and funding organisations, research institutions, and researchers in dealing with the barriers to and challenges in improving the international sharing of research-relevant digital objects. This is essential to help advance the science, technology and innovation (STI) agenda and help tackle societal challenges.

Access to data and other research-relevant digital objects enhances the reproducibility of scientific results, facilitates cross-disciplinary co-operation, stimulates economic growth through better opportunities for innovation, enables re-use of data in social innovation, increases resource efficiency, improves transparency and accountability, and returns on public investment, fosters scientific enquiry, secures public support for research funding and reinforces public trust in research.

OECD's work on Open Science since 2004

Since its Ministerial Meeting in 2004, the CSTP has been driving the agenda in favour of access to research data and contributed to establishing access to data as a major policy priority in the context of the digitalisation of research in the 21st century. The 2004 Ministerial Declaration on Access to Research Data from Public Funding [OECD/LEGAL/0321, abrogated in 2017], and the subsequent 2006 version of the Recommendation were key steps forward in this regard, with the latter representing the first internationally agreed-upon set of principles concerning access to data.

The 2006 version of the Recommendation has had significant impact in the years since its adoption and the principles it set down remain influential to this day. It served as inspiration for a host of multilateral and national policy instruments, including the European Commission's Recommendation on access to and preservation of scientific information and UNESCO's Policy Guidelines for the Development and Promotion of Open Access, both issued in 2012. A survey carried out by the CSTP in 2017 found that the Recommendation had "important" or "highly important" influence on 47% of national initiatives concerning open access to data adopted in the 2015-2017 triennium.

Since the adoption of the 2006 version of the Recommendation, however, new paradigms of data-intensive science and data-driven innovation have been transforming the landscape of science, technology and innovation. Digitalisation has changed the way scientists work, whether in their labs or together at a distance; it has created opportunities for expanding empirical work to new scales and territories ("big data"); it has made it easier to access scientific data and publications and collaboration in research ("open science"); it has helped to inform citizens of developments in STI, hence affecting public perceptions and engagement; it has facilitated the development of research co-operation between businesses, sometimes involving the public sector, and has contributed to transforming the fabric of innovation ("open innovation"); and, together with globalisation, it has favoured global value chains, enabling physically separate design and manufacturing activities, thus changing the industrial world map.

In terms of policymaking, a multitude of international initiatives and national policies have emerged since the adoption of the 2006 version of the Recommendation. Additional initiatives in the area include the Amsterdam Call for Action on Open Science, the International Open Data Charter, the 2018 revision of the European Commission Recommendation on access to and preservation of scientific information, the establishment of the European Open Science Cloud (EOSC), and the adoption of the FAIR data principles (FAIR stands for Findable, Accessible, Interoperable and

Reusable), as well as an increasing number of national policies. According to the 2017 EC/OECD STI Policy survey, 58 countries have dedicated national strategies and policies for open data and publications, and those that do not have such national policies often do have a critical mass of bottom-up institutional policies. These developments demonstrated the need to revise and update the 2006 version of the Recommendation.

A fully inclusive process for revising the Recommendation

In view of technological and policy advances since 2006, and in accordance with its Standard-Setting Action Plan, the CSTP determined that, while the principles set out in the 2006 version of the Recommendation remained relevant, it should be reviewed. The 2021 revision was anchored in analytical work by the CSTP in the area of access to research data, including a policy survey, a series of case studies, and two expert workshops. A synthesis of this work is published in the report Enhanced Access to Publicly Funded Data for Science, Technology and Innovation [https://doi.org/10.1787/947717bc-en].

The revision process was fully inclusive, with two successive sets of revised draft principles being discussed by the CSTP, before the drafting of a revised Recommendation began. The text of the draft revised Recommendation was developed under the guidance of an informal advisory group of national experts, open to all Adherents, in which eleven Adherents and the European Union actively contributed. Three successive drafts were produced, which were discussed in CSTP meetings and in written consultation. The process also included a consultation process with all relevant OECD bodies, as well as international experts and professional organisations in the field.

Scope of the Recommendation

The revised Recommendation reaffirms the relevance and importance of the principles of Openness, Flexibility, Transparency, Legal Conformity, Protection of Intellectual Property, Formal Responsibility, Professionalism, Interoperability, Quality, Security, Efficiency, Accountability, and Sustainability set out in the 2006 version of the Recommendation, while going on to provide updated policy guidance structured around seven key policy areas that have emerged as crucial to enhancing access to research data in recent years and since its adoption:

- Data governance for trust;
- Technical standards and practices;
- Responsibility, ownership and stewardship;
- Incentives and rewards;
- Sustainable infrastructures;
- Human capital; and
- International co-operation for access to research data.

In addition, the re-use of data is increasingly and critically dependent on the availability of related metadata, as well as bespoke algorithms, workflows, models, and software (including code), which are essential for their interpretation. Providing access to these digital objects, in addition to the data itself, is essential. The revised Recommendation seeks to capture this broader scope and covers all research relevant digital objects, rather than data alone.

Co-ordination with the development of general principles and policy recommendations on Enhancing Access to and Sharing of Data applicable across sectors

In parallel to the development of the revised Recommendation, three OECD committees – namely, the Committee on Digital Economy Policy (CDEP), the CSTP and the Public Governance Committee (PGC) – were working towards the development of general principles and policy recommendations on Enhancing Access to and Sharing of Data (EASD), with a view to their embodiment in a forthcoming Recommendation on EASD applicable across sectors and policy communities. The two processes were well coordinated with a view to ensuring coherence and compatibility across all OECD legal instruments relating to enhanced access to and sharing of data.

For further information please consult: http://www.oecd.org/sti/recommendation-access-to-research-data-from-public-funding.htm.
Contact information: alan.paic@oecd.org.

Implementation

The CSTP supports and monitors the implementation of the revised Recommendation and will report to the Council on the state of play regarding its implementation, dissemination, and continued relevance in 2026. In addition, the CSTP continues to serve as a forum for exchanging information on access to research data and experiences with the implementation of the Recommendation, as well as for fostering multi-stakeholder and interdisciplinary dialogue on the topic, developing analytical work and discussing novel approaches – for example, the use of pilots – to support and advance implementation.

THE COUNCIL,

HAVING REGARD to Article 5 b) of the Convention on the Organisation for Economic Co-operation and Development of 14 December 1960;

HAVING REGARD to the Recommendation of the Council concerning Guidelines Governing the Protection of Privacy and Transborder Flows of Personal Data [OECD/LEGAL/0188]; the Recommendation of the Council for Enhanced Access and More Effective Use of Public Sector Information [OECD/LEGAL/0362]; the Recommendation of the Council on Digital Security Risk Management for Economic and Social Prosperity [OECD/LEGAL/0415]; the Recommendation of the Council on Health Data Governance [OECD/LEGAL/0433]; the Recommendation of the Council on Artificial Intelligence [OECD/LEGAL/0449]; and the Recommendation of the Council on Responsible Innovation in Neurotechnology [OECD/LEGAL/0457];

REAFFIRMING the continued relevance and importance of the principles set out the original version of this Recommendation [C(2006)184], namely Openness, Flexibility, Transparency, Legal Conformity, Protection of Intellectual Property, Formal Responsibility, Professionalism, Interoperability, Quality, Security, Efficiency, Accountability, and Sustainability, while recognising that technological and policy advances call for updated policy guidance as provided in this revised version;

RECOGNISING the emergence of a consensus about the necessity for enhanced access to research data, and for making data FAIR (Findable, Accessible, Interoperable and Reusable);

RECOGNISING the significance of rapid and efficient access to research data, software, algorithms, and scientific workflows in international crisis situations which can accelerate advances of science and technology on the critical path to crisis resolution, as illustrated in the 2020 coronavirus pandemic;

RECOGNISING the rapid growth of data produced by and used in scientific research and innovation, as well as the new paradigms of data-intensive science and data-driven innovation that are transforming the landscape for scientific and technological policy in some scientific disciplines, as well as the significance of sharing the long tail of smaller datasets, important in other sectors;

RECOGNISING that re-use and value of data can depend on the availability of relevant metadata, algorithms, code, and software, from public funding together with information on workflows and the computational environment used to generate published findings, and that providing access to these other research-relevant digital objects from public funding along with the data itself can be essential;

RECOGNISING that research data and other research-relevant digital objects from public funding are a public good that can create value for society;

RECOGNISING the role of enhanced access to curated research data along with the associated metadata in enabling reproducibility of scientific results, reducing duplication of effort through re-use of existing data, and creating opportunities for new scientific insights by enabling interdisciplinary research;

RECOGNISING that enhanced access to research data, as well as to all research-relevant data and other digital objects from public funding, can promote scientific discovery, technological progress, innovation and economic growth, improve policy advice, and enhance welfare for individuals and society at large by enabling researchers to address global challenges efficiently, such as public health challenges (e.g. epidemics), climate change, and disaster risk reduction;

RECOGNISING that providing secure, fair, inclusive, legal, and ethical access to research data plays an essential role in enabling the development of artificial intelligence and other emerging technologies and applications, as well as their ethical and responsible use;

RECOGNISING that both data and software are subject to obsolescence over the long term, and that robust documentation and provenance metadata, active maintenance and long term updating of data format and

software design is needed to prevent obsolescence of research-relevant digital objects, as well as the portals and repositories where the objects are stored;

RECOGNISING that data related to research conducted by and with indigenous communities, collectives, and organisations must be managed in accordance with principles approved by those communities, collectives, and organisations, and on the basis of freely given prior and informed consent, and that such principles may include, but are not limited to, considerations of indigenous self-determination and data governance issues;

RECOGNISING that increased access to research data and software must be accompanied by measures to protect private, public, and community interests, including national security, intellectual property rights, privacy, personal data, the environment, key natural resources including water and minerals, and endangered species;

RECOGNISING that providing open access to an exponentially rising volume of research data and other research-relevant digital objects can be resource-intensive and subject to resource constraints, thus requiring prioritisation in the provision of access to research-relevant digital objects;

RECOGNISING that public-private partnerships can be an effective means to augment public capabilities to support data access and can contribute to improved knowledge creation and diffusion throughout economies and societies;

RECOGNISING the importance of human capital, in particular the necessity of specialised skills to enhance trust and realise the full potential benefits of enhanced access, sharing and re-use of research data and other research-relevant digital objects;

RECOGNISING that, while providing access to sensitive data on a restricted basis within safe, secure environments is possible, significant barriers to providing such access across borders remain, including the lack of interoperability of international legal frameworks ensuring consistent legal protection against misuse;

RECOGNISING that the design of specific policies on access to research data and other research-relevant digital objects will be shaped by individual Members and non-Members having adhered to this Recommendation's (hereafter, "Adherents") political, administrative, ethical and legal context, including the respective authorities and competences of different levels of government;

RECOGNISING that research is inherently global and that global approaches are often needed to establish and maintain datasets that constitute global assets and to develop appropriate standards, infrastructure, and other relevant international cooperation mechanisms;

RECOGNISING the potential benefits of applying the principles and policy recommendations set out in this Recommendation to all research-relevant data and other digital objects from public funding, while respecting existing data governance frameworks including on access, sharing and use of Public Sector Information.

On the proposal of the Committee for Scientific and Technological Policy:

I. **AGREES** that for the purposes of the present Recommendation, the following definitions are used:

- Research data from public funding: factual records (such as numerical scores, textual records, images, and sounds) resulting from research that is partially or fully funded by public funds, used as primary sources for scientific research, and that are commonly accepted in the scientific community as necessary to validate research findings. This term does not cover laboratory notebooks, preliminary analyses, or drafts of scientific papers, plans for future research, peer reviews, personal communications with colleagues, or physical objects, (e.g., laboratory samples, strains of bacteria, or test animals).

- Other research-relevant digital objects from public funding: metadata, algorithms, workflows, models, and software (including code) resulting from research that is partially or fully funded by public funds, which are used in a research and development context.
    - Algorithms: the computational steps and rules to be followed in calculations or other problem-solving operations, especially by a computer.
    - Code: source code, that is, a set of human-readable computer program instructions that expresses an algorithm so that it can be executed by a computer.
    - Software: refers both to code, and to executable files and libraries that are produced from source code.
    - Workflows: a precise description of the steps of a method used to generate research results using analogue (such as clinical protocols or anthropological interviews) and digital resources (such as data and code, including parameter settings, random number seeds, data and software dependencies, and code invocation sequences). Scientific workflow descriptions are often interpreted and executed by workflow management software that manages code access and execution, data access and movement, logging, and error handling.
- Research data management: the part of the research process that deals with organisation and handling of research data, including data management planning, structured storing, description, curation, preservation and provision of metadata and complementary algorithms, code, software, and workflows, and compliance with internal, national and international privacy legislation.

II. **AGREES** that the purpose of this Recommendation is to provide guidance on enhancing access to research data and other research-relevant digital objects from public funding.

DATA GOVERNANCE FOR TRUST

III. **RECOMMENDS** that Adherents develop and implement co-ordinated mechanisms, strategies, or policies to make research data and other research-relevant digital objects from public funding openly accessible and reusable to the largest extent possible, while taking into account the need to restrict access for legitimate private, public, and community interests. By developing and implementing such mechanisms, strategies, or policies, Adherents should:

1. Foster and support open access by default to research data and other research-relevant digital objects from public funding, that, to the greatest extent possible, is:

    a. timely, findable, user-friendly, and accessible by Internet;

    b. supported by regular curation and maintenance to prevent obsolescence of data format and software design and implementation;

    c. provided without discrimination as to the location or nationality of the user; and

    d. free of charge.

2. In cases where access needs to be partially or totally restricted to conform to legal rights, ethical principles and/or to protect legitimate private, public, or community interests, and with the ultimate objective of facilitating access which is as open as possible:

    a. foster more limited forms of access, such as access to aggregated or de-identified data, restricted access within safe and secure environments to certified users with clearance adapted to the sensitivity of data, or access via analyses that share only de-identified results;

    b. foster searchable access to metadata that describes those datasets while respecting legal rights, ethical, principles, and/or, legitimate interests.

3. Take steps to transparently manage risks posed by enhancing access to sensitive categories of research data and other research-relevant digital objects from public funding, including personal data, by applying specific risk mitigation measures, as well as providing for a “right to know” in cases of digital security incidents affecting the rights and interests of stakeholders.

4. Consult with communities of stakeholders about open access to, sharing of, and re-use of research data and other research digital objects from public funding for reinforcing trust. This should include establishing open and inclusive processes that ensure equitable representation of stakeholder groups and consideration of their respective needs.

5. Require that consent or comparable legal basis be sought consistently for all collections of sensitive human subject data and metadata, including personal data, and that any use be in conformity with the consent granted, applicable privacy regulations, and ethical principles. Where it is proposed that personal data be used in ways not initially foreseen in the consent granted and seeking consent for such new use is impractical, specific case-by-case arbitration implemented by ethics review boards or similar authorities may be appropriate. Such case-by-case arbitration should also be accompanied by a review taking into account legal aspects of the planned change of purpose.

6. Clarify roles and responsibilities of researchers and other staff responsible for data access, so as to promote awareness and a culture of confidence and avoid undue risk averseness.

TECHNICAL STANDARDS AND PRACTICES

IV. RECOMMENDS that Adherents take measures to promote, foster, and where appropriate, require compliance with technical standards and practices that make research data and other research-relevant digital objects from public funding findable, accessible, interoperable and re-usable. To this effect, Adherents should:

1. Foster improved findability of research data and other research-relevant digital objects from public funding, for example, by assigning unique digital persistent identifiers and publishing descriptive metadata.

2. Develop infrastructure and services to facilitate the accessibility of research data and other research-relevant digital objects from public funding within and across scientific domains and disciplines.

3. Promote interoperability by requiring the use of semantic (including ontologies and scientific terminology), legal (rights of use), and technical (such as machine readability) standards as appropriate.

4. Take steps to make research data and other research-relevant digital objects from public funding understandable and re-usable in the long term, including through the provision of high quality human-readable, machine-actionable, and open metadata and adequately maintained and supported bespoke algorithms, code, software, and workflows essential for re-use of data as free and open source.

5. Support the development, maintenance, adoption, dissemination, and implementation of technical standards that are open, freely accessible, and internationally agreed to the greatest possible extent.

RESPONSIBILITY, OWNERSHIP, AND STEWARDSHIP

V. RECOMMENDS that Adherents take measures to ensure a clear delineation and allocation of responsibility, ownership, and stewardship for access to publicly funded research data and other research-relevant digital objects from public funding across the research data ecosystem, while also tailoring and implementing licensing and other management of intellectual property rights to optimise scientific discovery and innovation and protect research data and digital object producers’ rights. To this effect, Adherents should:

1. Foster, and require where appropriate, the adoption of good practice for research data and software management across the research system and work with communities of researchers, institutions,

repositories, funders, and other stakeholders to support researchers in adopting coherent practices for management of research data and software.

2. Promote access to research data and other research-relevant digital objects resulting from public-private partnerships in ways that helps ensure data collected with public funds is as open as possible while recognizing and protecting legal rights and legitimate interests of stakeholders, including private-sector partners.

3. Support scientific advancement by taking the steps where necessary to enable new uses of research data and other research-relevant digital objects from public funding, such as for artificial intelligence and text- and data-mining techniques.

4. Promote, and require where appropriate, the inclusion of information about rights and licensing in the metadata of all research data and other research-relevant digital objects from public funding as part of the implementation of Research Data Management principles.

5. Encourage the widest use of open licences, where these are appropriate.

INCENTIVES AND REWARDS

VI. RECOMMENDS that Adherents, in co-operation with research institutions, funders, and scientific communities, foster and support the development and implementation of effective models of reward and recognition that provide incentives and remove disincentives for researchers and research support staff to provide access to research data and other research-relevant digital objects from public funding. To this effect, Adherents should:

1. Foster, and require where appropriate, the adoption of measures to recognise and reward the provision of access to, and maintenance of, research data and other research-relevant digital objects from public funding as a recognised research output, including by:

   a. developing criteria for researcher recruitment, advancement, and grant review that take into account the accessibility, quality, and impact of research data and other research-relevant digital objects from public funding, while taking into account the specific constraints resulting from potential sensitivity of certain datasets;

   b. supporting the development of robust and open indicators on the impact of access to research data and other research-relevant digital objects from public funding, including through the tracking of data and software citations;

   c. developing and adopting approaches such as contributor taxonomies that would be useful to facilitate giving credit for all contributions to the research endeavour, starting with the conceptualisation and research design, through data acquisition, curation, analysis, validation, documentation, packaging, and final write-up;

   d. fostering the creation of an environment favourable to new types of actions that facilitate the dissemination of research outputs beyond publications and their recognition within the research assessment process;

   e. promoting data and software citation in academic practice, including the development of data and software citation standards and acknowledgement of data and code creators and maintainers as key contributors with a view to fostering the adoption of such practices as a standard publishing requirement formulated by funding agencies.

2. Notwithstanding the general aim of providing timely open access to research data and other research-relevant digital objects from public funding, recognize that researchers and institutions may require a reasonable limited period of exclusive use of the research data and other research-relevant digital objects they produce, for example to provide time for data analysis and preparation of final results and/or intellectual property claims. Any processes involving restrictions, such as embargo periods, should be subject to clear

rules and limitations developed by funding agencies in co-operation with the relevant stakeholder communities.

3. Promote, and require as appropriate, the use of unique digital identifiers for individual researchers, and research-relevant digital objects to facilitate and improve citation and provision of due credit to authors and contributors.

SUSTAINABLE INFRASTRUCTURES

VII. RECOMMENDS that Adherents take necessary measures to support development and maintenance of sustainable infrastructures to support the findability, accessibility, interoperability, and reusability of research data and other research-relevant digital objects from public funding free of charge at the point of use. To this end, Adherents should:

1. Develop strategies, including road-maps, funding plans, and business models, to ensure sustainable infrastructures for research data and other research-relevant digital objects from public funding, including data and software repositories and services, in order to:

   a. prioritise, in consultation with stakeholders at the national and international level, research data and other research-relevant digital objects from public funding for short-, medium-, or long-term preservation;

   b. support efforts to improve interoperability among global research infrastructures to leverage national investments and innovation, and to encourage interdisciplinarity;

   c. safeguard research data and other research-relevant digital objects determined to be of high-value in the long term, including through provision for maintenance and support in order to ensure long-term sustainability and avoid unavailability and obsolescence over time, including in cases the specific infrastructure ceases to exist; and

   d. ensure an appropriate match between funding instruments, review criteria regarding the need for long term preservation of datasets and other research-relevant digital objects, and the expected longevity of needed infrastructure.

2. Encourage private investment in research data infrastructures with investment in the skills needed to manage and use them, while taking measures to facilitate their openness, reliability and integrity, and to protect the public interest over the long term by avoiding vendor lock in and ensuring data portability.

HUMAN CAPITAL

VIII. RECOMMENDS that Adherents support the development of the human capital necessary to realise the full potential benefits of enhancing access to research data and other research-relevant digital objects from public funding. To this effect, Adherents should:

1. Identify gaps and formulate strategies to develop and maintain the diverse skills necessary for data-driven research and innovation and thereby support:

   a. development of basic competence among all researchers and students to appropriately manage and reuse research data and other research-relevant digital objects and extract knowledge from them;

   b. training a cadre of dedicated data managers and stewards with expertise in curation and stewardship of research data, as well as research software engineers;

   c. development of cohorts of researchers with advanced (e.g., PhD-level) data-intensive research and data science skills suitable to discipline-specific needs;

d. the improved understanding, by relevant policymakers and research management staff, of approaches for effective management of research data and other research-relevant digital objects, and, if necessary, the training to accomplish their role;

e. the continued acquisition of data literacy skills by citizens to enable them to make effective use of research data.

2. Develop appropriate learning and training programs and resources to:

a. support lifelong learning and re-skilling where necessary, including through the development and provision of open educational resources and online learning, and making a sufficient number of quality digital training resources openly available so that they can be reused by other trainers;

b. ensure inclusivity and diversity in data and software management and training in digital skills for research;

c. raise awareness of potential bias in datasets and resulting analyses and promulgate effective approaches to mitigate such bias; and

d. involve, where appropriate, the private sector in the creation of sustainable training resources, in particular in the development and co-financing of relevant programmes.

3. Attract and retain data scientists and research software engineers across the breadth of scientific disciplines, notably through developing:

a. attractive career paths for data scientists and research software engineers within publicly funded research and innovation, including facilitation of transfers between scientific disciplines, as well as careers combined with private sector experience; and

b. recognition and reward of data management skills and software development skills as high value added to publicly funded research and innovation.

INTERNATIONAL CO-OPERATION FOR ACCESS TO RESEARCH DATA

IX. RECOMMENDS that Adherents collaborate at the international level on access to research data and other research-relevant digital objects from public funding in order to enable free exchange of ideas and enhance scientific discovery, notably where making use of datasets across borders bilaterally or multilaterally can help the advancement of science and contribute to solving global societal challenges. To this effect, Adherents should:

1. Work together in international fora, including through international professional organisations, to develop common definitions, data and security standards, and certification processes relating to access to research data and other research-relevant digital objects from public funding and design frameworks to enhance access, including access to sensitive data, across different jurisdictions and national borders. In this respect, Adherents should support relevant and appropriate consensus bodies for data policy, standards and good practice.

2. Seek to achieve synergies in data infrastructure by taking into account the international infrastructure landscape when designing and investing in national data infrastructure, for example through coordination of national repositories and data services or creating multinational repositories to store data for international use in certain domains. In this respect, Adherents should support relevant and appropriate funding, governance and collaboration schemes for international data infrastructure.

3. Co-operate to build a digitally-skilled research workforce through exchange programmes, sharing of best practices and training materials, and adapting them to specific requirements for capacity building in different national and international contexts.

4. With specific regard to sensitive data and other research-relevant digital objects, including personal data, share good practices and experiences in enhancing access to them across borders, recognising that the data may themselves have to reside in the host originating country. In this respect, Adherents should:

a. explore interoperability of legal and ethical frameworks to enhance data access across borders while protecting legitimate private, public, or community interests; and

b. work towards developing internationally compatible procedures for: (i) determining the degree of sensitivity of data; (ii) establishing criteria and protocols for the certification of institutions and researchers gaining access to such data; and (iii) establishing technological standards and approaches for secure remote access to such datasets.

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X. **ENCOURAGES** all stakeholders, as appropriate to their role and involvement in the research data ecosystem, to support and promote the implementation of this Recommendation.

XI. **INVITES** the Secretary-General and Adherents to disseminate this Recommendation.

XII. **INVITES** non-Adherents to take due account of and adhere to this Recommendation.

XIII. **INSTRUCTS** the Committee on Scientific and Technological Policy to:

a. Serve as a forum for:

i. exchanging information on policies and activities relating to access to research data and other research-relevant digital objects, including experience with the implementation of this Recommendation;

ii. fostering dialogue with and among stakeholders;

iii. developing analytical work to support the implementation of the Recommendation; and

iv. discussing novel approaches to advancing implementation of the Recommendation.

b. Monitor the implementation of this Recommendation and report thereon to the Council no later than five years following its revision and at least every ten years thereafter.

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- **Substantive Outcome Documents** are adopted by the individual listed Adherents rather than by an OECD body, as the outcome of a ministerial, high-level or other meeting within the framework of the Organisation. They usually set general principles or long-term goals and have a solemn character.

- **International Agreements** are negotiated and concluded within the framework of the Organisation. They are legally binding on the Parties.

- **Arrangement, Understanding and Others**: several other types of substantive legal instruments have been developed within the OECD framework over time, such as the Arrangement on Officially Supported Export Credits, the International Understanding on Maritime Transport Principles and the Development Assistance Committee (DAC) Recommendations.