Research data and open access to outputs/results

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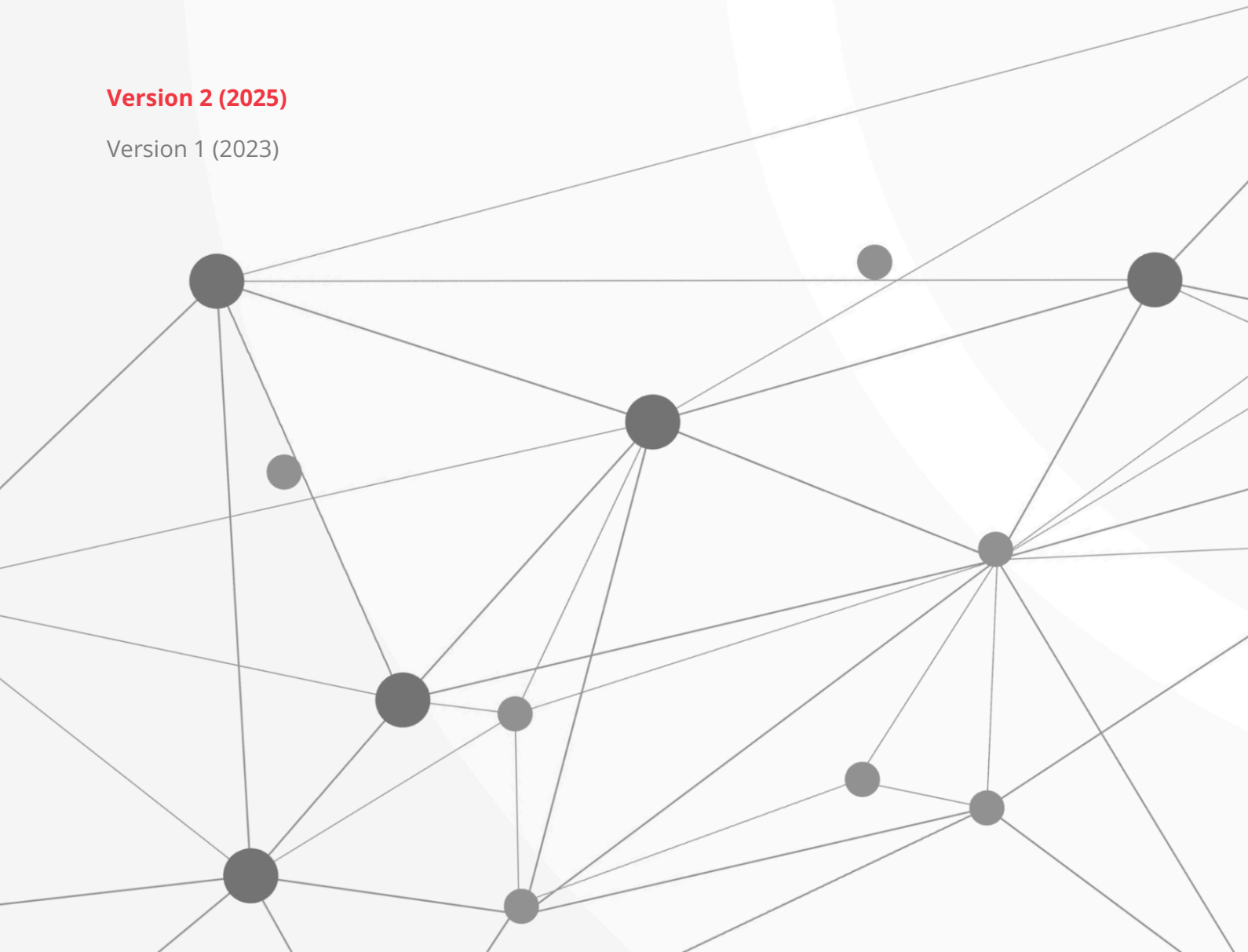
Version 1 (2023)



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Introduction

Open access to results and data has been a trend in the EU in recent years, which is gradually coming to the Czech Republic as well.

The task of TA CR is to fund applied research. For TA CR, commercial or other practical use of the results of projects it funds is therefore paramount in all cases. Project beneficiaries should always first consider whether it will be possible to use the outputs/results or the data generated in practice, and especially commercially.

The 2022 amendment to Act No. 130/2002 Coll., on the Support of Research and Development (ASRD), enacted the obligation to publish/provide research data on results funded by state aid for all projects from calls for proposals in research, development and innovation, international calls and public tenders in R&D announced after 9 January 2022.

Therefore, TA CR requires compliance with the legal conditions for the provision of research data after this date in all its programmes. For selected programmes, respectively calls for proposals or international calls, it also requires open access to selected types of results. It assumes the gradual introduction of mandatory open access in all its programmes. By gradually introducing the principles of open access, TA CR wants to prepare beneficiaries for further research collaboration not only within the framework of European programmes and initiatives. The aim is to apply the common principle in the EU that research results and research data are not published only in justified cases (e.g. commercial or other use).

The purpose of open access is to make research outputs/results and the data necessary for their validation available to the widest possible audience and as soon as possible after their creation. Open access supports the preservation, possibility of verification or wider use of outputs/results and research data in practice or in subsequent research (also in other fields). It accelerates the achievement of outputs/results and significantly supports innovation. Open access also contributes to transparency and control over the use of state aid, increasing quality, trust, and creativity in research.

1. Open Access to Research Data

Research data means[1] information, other than scientific publications, in electronic form that is collected or created during research or development and is used as evidence in the research process or development or that are generally accepted by the research community as necessary to validate research or development findings and results.

Open access means ensuring free online access by anyone to research data for their further exploitation, use, reproduction, and dissemination. Research data are used to validate the presented outputs/results, contribute to further and faster innovations, and increase the citation of publications. The "as open as possible, as closed as necessary" approach should apply to open data and its sharing, i.e., as open as possible, but closed as necessary, taking into account the interests of the beneficiary. In addition to the openness of data, it is also important to adhere to the FAIR principles when sharing them:

- **Findable** – data can be easily found by humans and machines, it is described by high-quality metadata with a unique identifier.
- **Accessible** – data are stored in a suitable repository and available in open access, with clear information on the conditions and possibilities of using the data, guaranteeing long-term free access.
- **Interoperable** – data are stored in a standardised format and described using controlled vocabularies and standardised expressions.
- **Reusable** – data are sufficiently described and shared under the least restrictive license so that data users know how the data was created, what they describe, and how they can be used.

Beneficiaries should responsibly manage research data generated during their project in accordance with the above principles. High-quality data management improves transparency, efficiency, risk management, organisation, and preservation of data, ensures continuity and consistency during any changes in staff, prevents duplication of activities, and facilitates writing publications and data sharing.

Therefore, the management and provision of research data for projects (not only the data necessary to verify the result published in open access) is now regulated by Act 130/2002 Coll. The obligations listed below shall apply to all projects from calls for proposals, international calls, and public tenders in R&D, with any differences always being indicated.

[1] Article 2(2)(o) of Act 130/2002 Coll.

1.1. Obligations Towards TA CR

For **calls for proposals** in research, development and innovation and for **international calls**, TA CR has set, on the basis of Act 130/2002 Coll., the following **obligations** for the beneficiary:

1. In the project proposal, describe the method of managing project research data and provide information on the availability and method of dissemination of research results and research data, if they were created with funding from state aid pursuant to this Act, in accordance with the principle that research results and research data are not published only in justified cases;

2. Submit the Data Management Plan together[2] with the first interim report, which will contain information about;

- **a.** which data will be created, processed, or collected;
- **b.** what methods and principles of their management will be used with regard to the FAIR principles (findability, accessibility, interoperability, and reusability);
- **c.** how the data will be shared and published;
- **d.** and in what way will the data be stored during the implementation of the project and preserved after the end of the project;

3. Submit an updated version of the Data Management Plan to the provider as part of each subsequent interim and final report;

4. Share research data, or at least metadata, at the end of the project at the latest, or justify their non-disclosure (or provision of research data upon request) in the Data Management Plan. The obligation to provide data may also be met by providing a link to the place where the research data are already published;

5. In the event that open access is not provided (to some or all the research data), beneficiaries must thoroughly **justify this fact in the Data Management Plan** and **at least publish the metadata** (information on the research data). However, the beneficiary should review whether the reasons for non-disclosure of the research data are still valid at least once per year for a period of 5 years from the end of the provision of funding. In the event that the reasons have ceased to exist (e.g., the result could not be commercially exploited), the information on research data should be published via the Information System of Research, Development and Innovation;

[2] For international calls, the submission deadline together with the first interim report is the latest possible. If the international rules state an earlier submission deadline, the beneficiary must comply with this deadline.

6. **Metadata** of stored research data must be publicly available (to the extent that legitimate interests or restrictions are protected) and machine-readable in accordance with the FAIR principles. The metadata should include the name of the data, the full names of the creators and contributors, information about the funding provider, programme and project, and the publication date, language of the data, length of embargo, and a persistent (permanent) identifier (for example, Digital Object Identifier "DOI") should be indicated. It is also recommended to provide other information such as: license conditions, permanent identifiers of persons, organisations and funding. Beneficiaries should provide sufficient information through the repository about all other research results or tools and instruments needed to reuse research data or validate them;

7. TA CR does not specify a specific method of data storage, type of repository, etc., but prefers the use of already existing solutions, ideally with a European or at least national reach;

8. Beneficiaries select the project data (taking into account the information specified in the Data Management Plan) that are suitable for publication and their format. The use (especially commercial) of the data/result shall always take precedence over publication (see point 11 of this document and see the statement of TA CR https://www.TACR.cz/stanovisko-ta-cr-k-otevrene-vede/) and is therefore a legitimate reason for not publishing the data. In the event that the beneficiary decides not to publish the data, it should at least publish information about what data it has collected or what data it has created;

9. The data shall be provided free of charge. The beneficiary shall provide the research data and information about them in an open and machine-readable format and under conditions that are objective, reasonable, non-exclusive, non-discriminatory, and do not limit the method or purpose of the subsequent use of the research data provided. (see FAIR data);

10. A CR does not specify whether primary data or already modified (secondary) data should be provided. It always depends on the common practices in a specific field. We recommend publishing the data that you consider in the given case to be the most appropriate for verifying the result and for further use by other interested parties;

11. Beneficiaries and other project participants **are not obliged to make research data available** if their disclosure would cause an unreasonable interference with:

    a. the right to protection of intellectual property;

b. the right to protection of privacy and personal data;

c. the right to protection of trade secrets, state security, or other legitimate interests of the beneficiary (e.g., in the case of the possibility of commercial use).

12. **Beneficiaries must submit information** about the research data not only to TA CR, but also to the Information Register of R&D Results (box R97[3]) and update the data within 5 years of the end of the project (e.g., if the reasons for not publishing the data have ceased to exist, e.g., if the result could not be commercially exploited).

1.2. Data management plan form

- For calls for proposals and international calls, beneficiaries can choose between the:
  - **a.** TA CR form
  - **b.** European Commission template for the Horizon Europe programme
- It is also possible to use the English version of the template for the Horizon Europe programme, including the version generated using DSW or another similar tool.
- For international calls, another type of form can also be used, which is determined by the international rules of the relevant call.
- The forms are attached to the call documentation/conditions for participation in the call for proposals/call.
- The form entitled "Information on open access to results and data from research" shall be used to report open access to the results and data from the research in interim and final reports, or this information shall be added directly to the information system.

1.3. Data management recommendations

- Update the Data Management Plan every year to describe and reflect the actual progress of the project implementation.
- For public tenders, update the Data Management Plan continuously and report changes to the provider.
- Create a backup or use online synchronisation.
- Describe the data with metadata in a standardised format when collecting them.
- Store data in an open format in trusted repositories as soon as possible.

[3] An URL link to research data (set of research data) published, for example, in an institutional or thematic archive or repository, which are the result of scientific research activities funded by state aid or co-financed by public and private entities, should be provided. Research data represent a specific category of documents prepared as part of scientific research, namely the outputs of the process of scientific discovery (experiments, surveys, etc.). A persistent link is preferred as the URL.

- We recommend using specialised, university, and institutional repositories to store research data in an open mode.

Elaboration of the Data Management Plan is facilitated by special **platforms** (currently only in English), which, among other things, allow for checking the achievement of FAIR principles, for example:

a. DMPonline
b. Data Stewardship Wizard
c. Argos OpenAIRE project

It is also possible to use the DCC checklist to help create your Data Management Plan. For advice on data management, visit https://fairsharing.org/.

The FAIR principles are available here: in Czech Jak FAIR jsou má výzkumná data? / in English How FAIR are my data?

2. Open Access to Outputs/Results

In some calls for proposals and international calls, TA CR require, **beyond the scope of Act 130/2002 Coll., and beyond the above** - also **mandatory open access to the results and research data necessary to verify these results**.

The types of results to which this obligation applies are always specified in the call documentation/conditions of the relevant call for proposals or international call in R&D&I. These are usually type J, N and Vsumm results.

These are mainly publication results for which publication in the form of open access is simple or the obligation to publish them follows directly from the definition of the given type of result. For calls for proposals announced after January 2025, open access applies to all type J, N and Vsumm results, regardless of whether they are created as planned results or results beyond the scope. In the case of other types of results for which making them available is technically simple (article in a collection of proceedings, chapter in a professional book, etc.), making them available is particularly welcome and recommended.

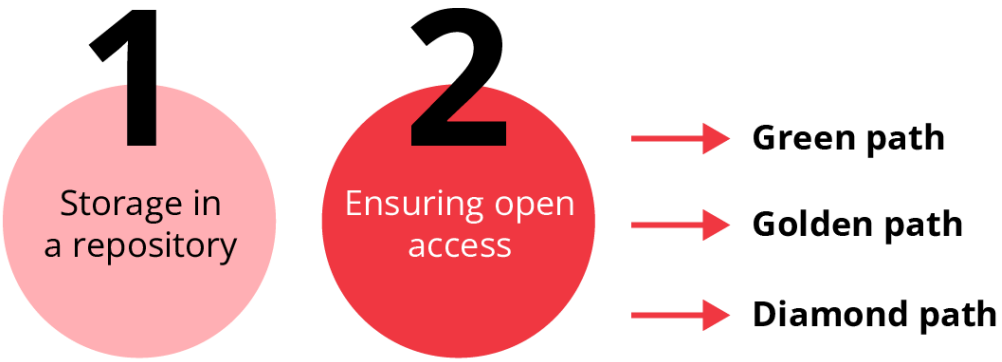
In these cases, the beneficiary is obliged to ensure open access to all outputs/results specified in the call documentation and to all research data related to such outputs/results (so-called “underlying data” and metadata).

The output/result together with the underlying data (obtained as part of the project solution) must be made available without undue delay. The exception is the situation where disclosure would make it difficult or even preclude its use, usually commercial, but theoretically possibly also others (e.g., in follow-up research or teaching). In which case, it is necessary to document why and for how long the aforementioned difficulty or use can realistically be expected. In such a case, publication can also take place with a time delay (6 months or 12 months in the case of social sciences and humanities), but no later than **by the end of the project solution**.

Output/outcome data should be findable, accessible, interoperable and reusable (FAIR).

In the case of international calls, the rules established at the international level take precedence in the event of any conflict.

3. How to publish a result/data



The condition of open access is considered to be met if both of the following steps are met:

1. **The output/result is saved in a repository** – the beneficiary must **save** the machine-readable final version of the text (i.e., the publisher's version, or postprint) in the repository without unnecessary delay after completing the output/result. The beneficiary should store underlying data in the repository at the same time as saving the output/result.
2. **Open access to the output/result is ensured** – the beneficiary must **ensure open access (publish)** in one of the following ways (more detailed explanation e.g.: https://open-access.network/en/information/open-access-primers/green-and-gold)

   2.1. Auto-archiving (the green path of open access) - Making the full text and research data available in an open, trusted repository within 6 months (12 months in the case of social sciences and humanities) from publication (of an article or similar publication results) or from completion (for other types) of the result, but by the end of the project at the latest. For this purpose, the beneficiary may conclude an addendum to the publication contract with the publisher, an example can be found here. The option of storing and publishing in a repository is inherently suitable for publishing research data and type N or Vsumm results.

   2.2. Publishing in an open journal (the golden path of open access) - Immediate open access through the publication of an article in an "open journal". The publisher usually requires the author to pay a fee (an article processing charge - APC).

2.3. Publication in an open journal without fees (the so-called diamond/platinum/non-commercial path of open access - hereinafter referred to as the "diamond" path). In this case, both the publication of the article and access to it are free of charge.

Steps 1 and 2 may or may not occur at the same time, depending on the open access path selected in step 2, whereby in the case of the green path (2.1), publication of the stored output/result depends on the embargo period specified by the publisher. Even when selecting the golden/diamond path, it is necessary to deposit the output/result in the repository to ensure its long-term preservation.

Due to the differences between the fields, TA CR does not determine which type of license or type of access (green, gold or diamond) the beneficiary should prefer. Some universities offer their researchers the possibility to use so-called tokens, when used, publishing in open journals is free of charge. We recommend that you ask about this possibility.

The beneficiary must enable open access to the bibliographic information (metadata) of the published output/result in the selected repository. **Metadata** should include the title of the publication, full names of creators and contributors, information about the support provider, programme, and project, and indicate the date of publication, the language of the output/result, the length of the embargo, and a persistent (permanent) identifier (for example, a Digital Object Identifier "DOI"). It is also recommended to include other data such as: license conditions, permanent identifiers of persons, organisations, and support. The metadata should also contain permanent identifiers to other outputs (e.g., research data) or a permanent link to any other tools needed to verify the conclusions of the output/result.

Any publication costs associated with publishing in open journals or publication platforms or costs associated with data preparation and storage shall be eligible costs for the duration of the project.

It is common for **intellectual property rights** to pass to the publisher upon publication. One of the principles of open access is for **the author to retain these rights**. When publishing, it is necessary to request the retention of these rights and enter into a contract that allows this.

The TA CR recommends that the beneficiaries do not transfer the copyright to the outputs/results and grant the publisher only the necessary license for publication. TA CR further recommends publishing outputs/results under public licenses, e.g., Creative Commons (CC-BY), which allows others to access, exploit, use, disseminate, and reproduce the research work and data and works derived from it. The only limitation is the attribution of the author.

A link to the full text of the result shall be provided not only to TA CR, but also to RIV (box R86).

4. Differences in the procedure for the programme for public tenders in research, development and innovation

For public tenders in research, development and innovation, the rules set out in Chapter 1.1 apply with the following differences:

- The first Data Management Plan is submitted by the selected contractor/funding beneficiary before signing the Contract.
- The form of the Data Management Plan is determined by the Contracting Authority (TA CR) for each public tender.
- Changes to the Data Management Plan are notified by the beneficiary on an ongoing basis (when they occur, not on a regular date).
- The final version of the Data Management Plan is submitted by the beneficiary upon completion of the project.

5. Additional Information

Open repositories

Beneficiaries can use the Czech National Repository (https://data.narodni-repozitar.cz/ - currently under pilot operation), the Academy of Sciences ASEP repository (only for employees of the Academy of Sciences of the Czech Republic), or branch-specific repositories, e.g., ČSDA, Lindat/Clarin repository. Among the international ones, the best-known European multidisciplinary repository is Zenodo.org.

A list of suitable open repositories is available, for example, in the international database OpenDOAR, the register of open repositories ROAR, the register of data repositories re3data, or in the catalogue of databases FAIRsharing.

Other data repositories

- GitHub
- EUDAT B2SHARE
- Databib
- Dryard

Open journals

A suitable open journal may be found in the citation registers Web of Science, Scopus, or in the international database of open journals DOAJ.

The SHERPA/RoMEO service provides information on open access for **individual publishers** of scientific journals.

Other useful educational links

- OpenAIRE (EN)
- FOSTER project E-learning (EN) Openaccess.cz (CZ/EN) Open data (CZ)
- Open Science na MUNI (CZ/EN)
- Open Science Suppport Centre at Charles University (CZ/EN)

6. Glossary of Terms

Open Science – a concept promoting greater transparency, openness, and collaboration in research based on the dissemination of knowledge using digital and collaborative technologies. Open science involves the sharing and reuse of scientific methodology, data, tools, and materials, and the availability of research results to researchers and the general public (particularly when funded by state aid)

Open access – permanent, immediate, and free online access to full texts of scientific publications/research data

Open data – data freely available via the Internet for their further extraction, use, reproduction, and dissemination

Repository – a data repository, online archive for scientific publications or research data

Open Repository – a repository for documents and data in the open access mode

Open journal – professional / scientific journal freely available in the open access mode

Embargo – the period from the publication of an author's work during which the publisher prohibits its publication in the open access mode

Research data – information, with the exception of scientific publications, in electronic form that is collected or created during the course of research or development and is used as evidence in the research or development process or that is generally accepted by the research community as necessary to validate research findings and results or development

Metadata – bibliographic data used for the identification and searchability of datasets/publications/results

Data management – a group of activities associated with data management

Data Management Plan – a formal document describing the management cycle of data collected, processed, or generated during the solution and after the end of the project