HELMHOLTZ
Metadata Collaboration

# Research Data Policies: Best Practices and Essential Elements

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# Key Points

Background Research Data Policies

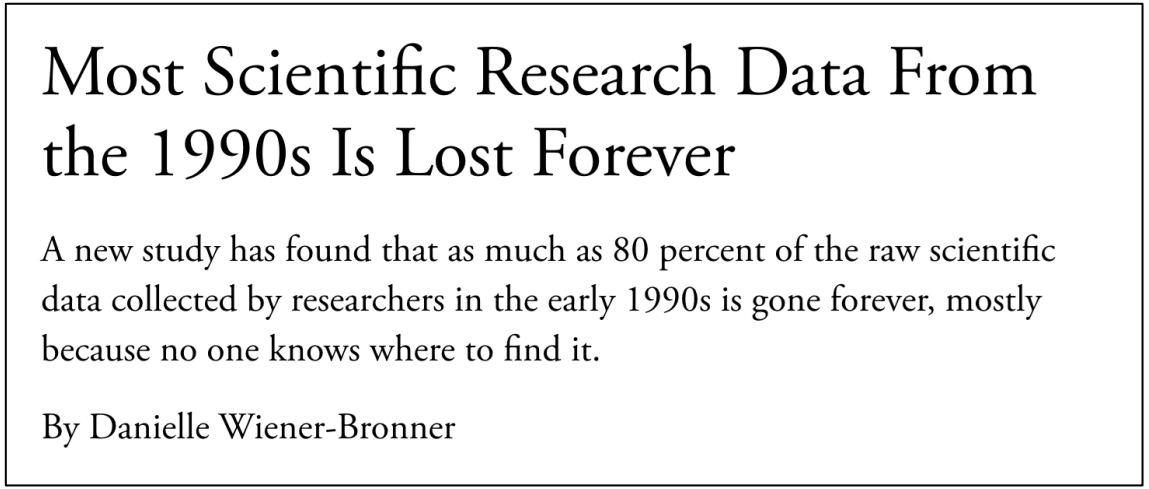
Purpose of Research Data Policies

Best Practices & Key Elements of Data Policies


ÖZKAN, Ö. (2023) https://doi.org/10.5281/zenodo.10198909

# Why Research Data Management?

Data is **fragile and easily lost**.



## Most Scientific Research Data From the 1990s Is Lost Forever

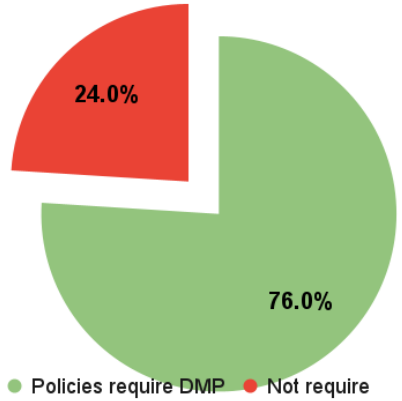
A new study has found that as much as 80 percent of the raw scientific data collected by researchers in the early 1990s is gone forever, mostly because no one knows where to find it.

By Danielle Wiener-Bronner

https://www.theatlantic.com/national/archive/2013/12/scientific-data-lost-forever/356422/

# Why Research Data Management?

Growing number of **funders** and **publishers mandate research data requirements**




## Analysis of international funder data polices

Joris van Rossum

In October 2021, STM commissioned a research on funder data policies. The top 100 funders based on number of Crossref records were selected, and analyzed for the availability of data polices. These data policies were analyzed according to the elements of the journal data policy framework as developed by Hrynaszkiewicz et al. (https://datascience.codata.org/article/10.5334/dsj-2020-005/). This research will be used as input for more alignment between funder and data policies.

Files (2.1 MB)

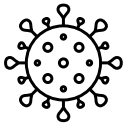
| Name | Size | |
|---|---|---|
| STM analysis funder data policies (October2021).xlsx | 2.1 MB | Download |

md5:e517d7e79ab4f1035849ee131d436aa4

Joris van Rossum. (2021). Analysis of international funder data polices (1.0) [Data set]. Zenodo. https://doi.org/10.5281/zenodo.5643352

# Why Research Data Management?

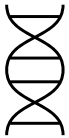
**Facilitates sharing of research data** and, when shared, data can lead to valuable discoveries by others outside of the original research team.



**Day 0**

**The first Covid19 cases** were reported.

**Day 10**



The **first genome sequence of the Sars-Cov-2 virus** was decoded and **shared <u>openly</u>** by Chinese scientists.

**Day 76**

That sequence was **used** by the company Moderna to develop the vaccine.

We saw the **impact** and **effect of Open Science in a real life** example**!**

# Why Research Data Management?

Good management helps to **prevent errors and increases the quality of the analyses, saves time and resources** in the long run.

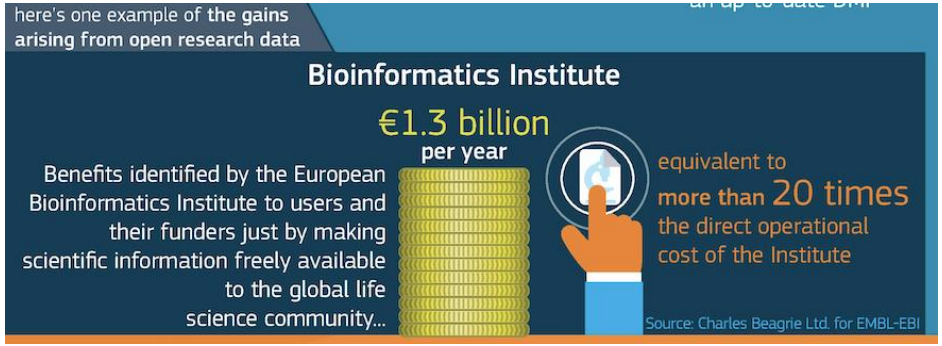
European Commission

In May 2018, the EU Commission published a report: not having FAIR research data costs the European economy at least **€10.2bn**/year

**Cost of not having FAIR research data**

Cost-Benefit analysis for FAIR research data

doi: 10.2777/02999

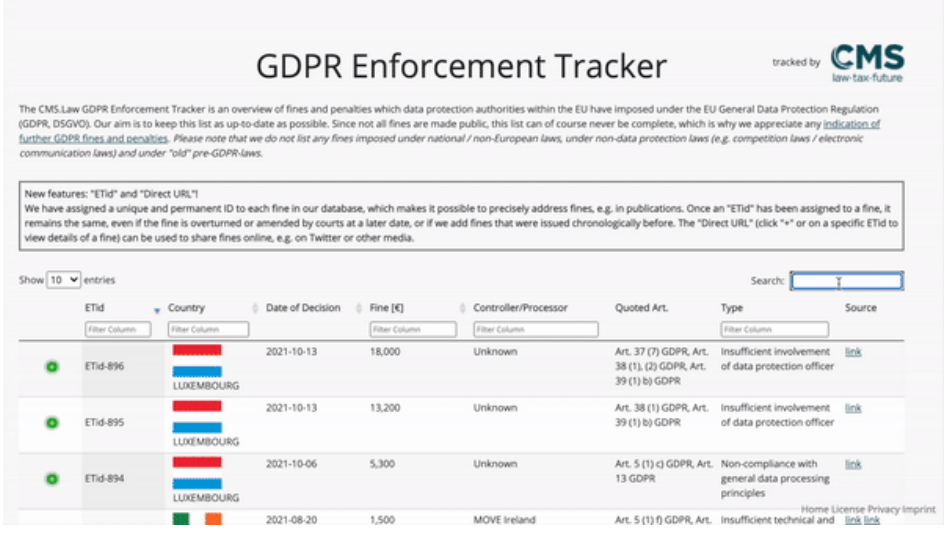



https://www.embl.org/documents/wp-content/uploads/2021/10/EMBL-EBI-impact-report-summary-2021.pdf

# Why Research Data Management?

Helps to **comply with legislative requirements** such as GDPR.

According to [GDPR enforcement tracker](), up to now **22 universities** have been imposed fines and penalties.



GDPR Enforcement Tracker

tracked by CMS law-tax-future

The CMS.Law GDPR Enforcement Tracker is an overview of fines and penalties which data protection authorities within the EU have imposed under the EU General Data Protection Regulation (GDPR, DSGVO). Our aim is to keep this list as up-to-date as possible. Since not all fines are made public, this list can of course never be complete, which is why we appreciate any indication of further GDPR fines and penalties. *Please note that we do not list any fines imposed under national / non-European laws, under non-data protection laws (e.g. competition laws / electronic communication laws) and under "old" pre-GDPR-laws.*

New features: "ETid" and "Direct URL"!
We have assigned a unique and permanent ID to each fine in our database, which makes it possible to precisely address fines, e.g. in publications. Once an "ETid" has been assigned to a fine, it remains the same, even if the fine is overturned or amended by courts at a later date, or if we add fines that were issued chronologically before. The "Direct URL" (click "+" or on a specific ETid to view details of a fine) can be used to share fines online, e.g. on Twitter or other media.

Show 10 entries Search:

| | ETid | Country | Date of Decision | Fine [€] | Controller/Processor | Quoted Art. | Type | Source |
|---|---|---|---|---|---|---|---|---|
| | ETid-896 | LUXEMBOURG | 2021-10-13 | 18,000 | Unknown | Art. 37 (7) GDPR, Art. 38 (1), (2) GDPR, Art. 39 (1) b) GDPR | Insufficient involvement of data protection officer | link |
| | ETid-895 | LUXEMBOURG | 2021-10-13 | 13,200 | Unknown | Art. 38 (1) GDPR, Art. 39 (1) b) GDPR | Insufficient involvement of data protection officer | link |
| | ETid-894 | LUXEMBOURG | 2021-10-06 | 5,300 | Unknown | Art. 5 (1) c) GDPR, Art. 13 GDPR | Non-compliance with general data processing principles | link |
| | | | 2021-08-20 | 1,500 | MOVE Ireland | Art. 5 (1) f) GDPR, Art. | Insufficient technical and | link link |

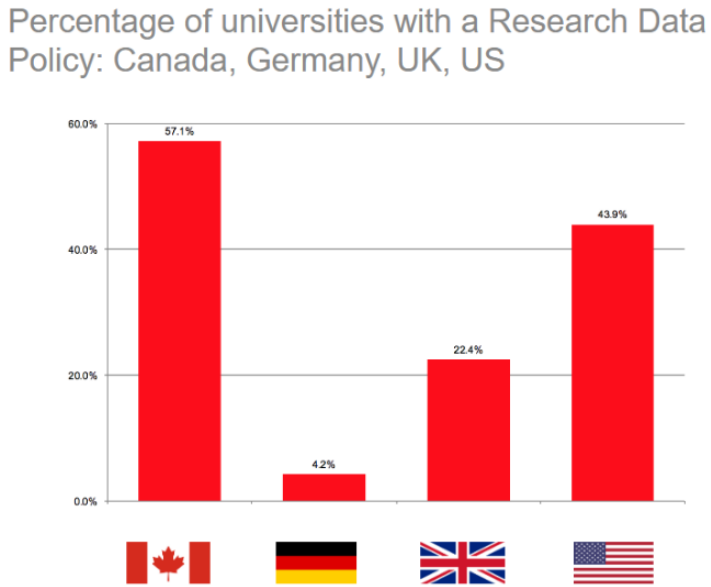
Home License Privacy Imprint

These should be regulated in a written document!

**Research Data Policy**

# What is a Research Data Policy?

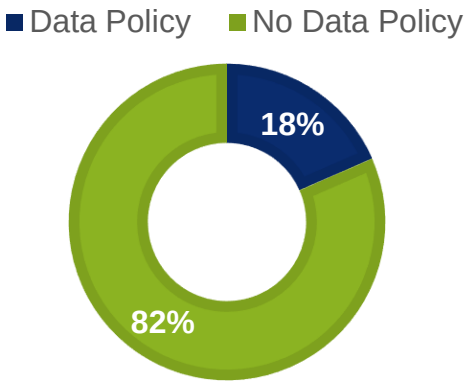
A data policy is a set of guidelines that govern the collection, management, and sharing of research data.




Laurence Horton. (2016, June 30). 7.1 'The Road to Data Sharing is Paved with Good Intentions': Looking at UK Research Data Policies. Zenodo. https://doi.org/10.5281/zenodo.3607367

# Now

According to forschungsdaten.org, **71 German universities** have a Research Data Policy and as of 2023, there are **385 universities** in Germany.



# Other reasons to have a Research Data Policy

We need to respond national research funder's and funders' guidelines, and organizations' principles:

- **DFG - German Research Foundation:** Guidelines for Safeguarding Good Research Practice[1]
- **Science Europe** strongly recommends research organizations to have a data policy for sustainability of research data management.[2]
- **European Open Science Cloud (EOSC), European Research Council (ERC), Horizon Europe,** etc. underline importance of open science and FAIR (Findable Accessible Interoperable Reusable) principles.

[1] DFG Guidelines for Safeguarding Good Research Practice (2022) https://doi.org/10.5281/zenodo.6472827

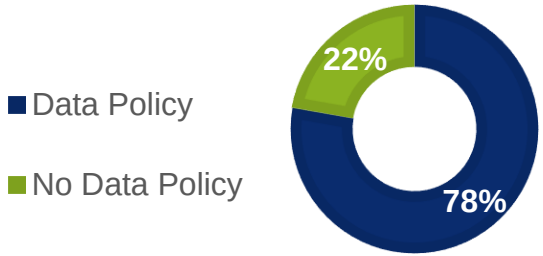
[2] Practical Guide to Sustainable Research Data (2021). https://doi.org/10.5281/zenodo.4769703

# The Helmholtz Centers are implementing high level requirements

## Helmholtz Open Science Policy: all centers should have a data policy in place

"All Helmholtz Centers will establish detailed procedures for managing research data in publicly available policies…"[3]

14 out of 18 Helmholtz institutes have data policy.





[3] Helmholtz Open Science Policy. Version 1.0. (2022). https://doi.org/10.48440/os.helmholtz.056

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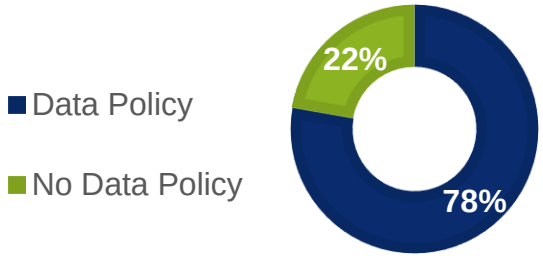




[3] Helmholtz Open Science Policy. Version 1.0. (2022). https://doi.org/10.48440/os.helmholtz.056

# Best Practices & Key Elements of Data Policies

# FAIRsFAIR: FAIR-enabling data policy checklist


| | | | |
|---|---|---|---|
| Metadata sharing | The policy should make clear any expectations around metadata sharing in particular when the data cannot be shared openly or if data are no longer accessible. An emphasis should be placed on making clear whether metadata sharing is required or is suggested. | | • The policy clearly states that sharing metadata for selected data outputs is required. |
| | | | • The policy encourages metadata sharing but does not require it. |
| | | | • The policy does not address metadata sharing or lacks clarity over what is expected of researchers when it comes to sharing metadata. |
| Data Management Plan (DMP) | Policies should provide clarity over whether there is an expectation for researchers to develop a DMP as part of their research. | | • The policy makes clear whether a data management plan should be developed. |
| | | | • The policy does not clearly state whether a data management plan should be developed. |
| Timing of DMP | Where DMPs are required, policies should provide clarity over the timing of their preparation and delivery (pre award, in award, post award). If multiple versions are required at different stages, this should be made clear. | | • The policy makes clear at what stage the DMP should be prepared. |
| | | | • The policy lacks clarity about when the DMP should be prepared. |
| | | | • The policy does not include an expectation for a DMP . |

Davidson, J., et al. (2022). FAIR-enabling Data Policy Checklist (2.0). Zenodo. https://doi.org/10.5281/zenodo.6225775

This checklist is designed to assist policy-makers at all levels to ensure that their data policies are in alignment with the FAIR (Findable, Accessible, Interoperable, Reusable) Principles.

→ The checklist consists of 28 policy elements to be addressed in order to align with the FAIR principles.

# Policy Elements

**Clear Titling**: Policies should have a clear title indicating the scope and applicability.

*Ensure your policy has a title that clearly identifies its owner and subject matter.*

… University Research Data Policy

**Validity and Versioning**: Differentiating between the creation and implementation dates, and using PIDs for versioning.

*Clearly state the policy's effective date and establish a scheduled review date.*

*Assign Persistent Identifiers (PIDs) to versioned policies for seamless tracking.*

# Policy Elements

**Registration and Availability**: Registering policies with services like FAIRsharing and making them openly available online in a structured format.


ÖZKAN, Ö., & Mannix, O. (2023). Is your data policy findable and accessible? Check these four elements. Zenodo. https://doi.org/10.5281/zenodo.10074955

# Policy Elements

**Definition of Scope:** Providing clear definitions for what the policy covers, such as research data and software.

EOSC Glossary:


EOSC Glossary Interest Group. (2020). EOSC Glossary. Zenodo. https://doi.org/10.5281/zenodo.4472643

# Policy Elements

**Data Management Planning (DMP):** Requiring the development of a DMP as part of research practice.

Four Options:

- The policy requires the development of a data management plan.
- The policy encourages the development of a data management plan.
- The policy refers to data management plans.
- The policy does not address data management plans.

* But **requirement of a DMP** requires many resources to consider:
  - Data Stewards/Managers
  - Infrastructure to support short and long term preservation; data sharing; sensitive data handling etc.
  - A DMP tool

# Policy Elements

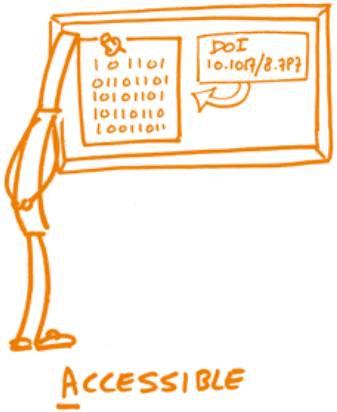
**Data Sharing Requirements**: Stating requirements for data sharing, including valid reasons for not sharing and exceptions.

The policy

- can require data sharing.
- can encourage data sharing.
- does not address data sharing.

**Metadata Sharing Expectations**: Clear expectations around metadata sharing, especially when data can't be shared openly.

- Ensure metadata is stored in accessible databases (*use standard metadata schemas **relevant to your field***)




Open Science Training Handbook
https://doi.org/10.5281/zenodo.1212496

**Data Protection Legislation**: Outlining expectations for compliance with laws like GDPR.

# Policy Elements

**Encouragement of Reuse and Licensing**: Requiring appropriate licenses and providing guidance to help researchers select these.

*"Choose licenses that promote data sharing while respecting data ownership.“*

Helmholtz Open Science Policy:

“… the provision of open access to the deposited **data** as early as possible and within the time limits specified in the DMP under the latest available version of the **Creative Commons Attribution International Public License (CC BY)** or the **Creative Commons Public Domain Dedication License (CC0),** or a license that grants equivalent rights”

“… the **metadata** of the deposited publications are accessible under a **Creative Commons Public Domain Dedication (CC0)** license or another equivalent license.”[1]

[1] Helmholtz Open Science Policy. Version 1.0. (2022). https://doi.org/10.48440/os.helmholtz.056

# Policy Elements

**Retention and Preservation**: Clear guidance on the retention period for outputs and linking to relevant preservation policies.

According to DFG Guidelines for Safeguarding Good Research Practice "*Retention of research data should be guaranteed for **10 years**.*"[1]

However, in funder policies this number vary or there can legal or contractual reasons so it is better to formulate the statement considering them.

**Example: MDC Research Data Policy**

*"Research data and related material should be retained for a minimum of ten years after acquisition or generation based on the recommendation of the DFG. Longer or shorter retention periods prevail in accordance to legal regulations, funders' and other contractual requirements (e.9. clinical trials, patents)."*[2]

[1] DFG Guidelines for Safeguarding Good Research Practice (2022) https://doi.org/10.5281/zenodo.6472827

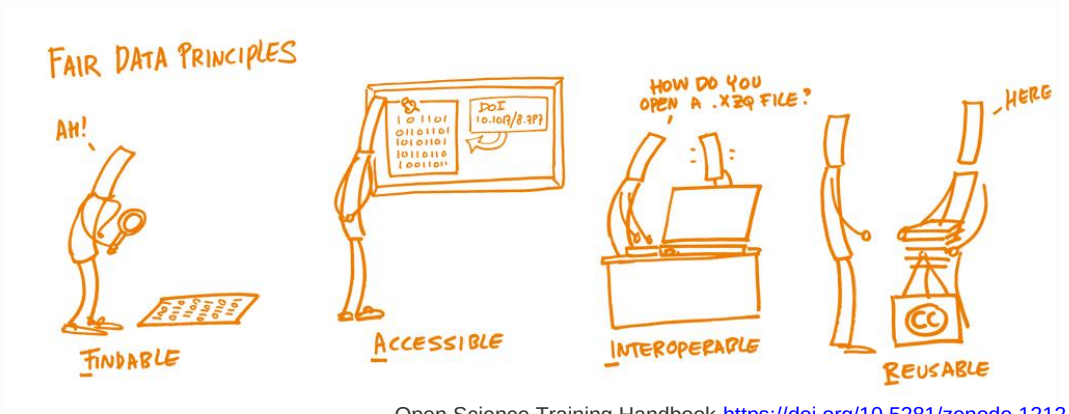
[2] https://www.mdc-berlin.de/research-data-management/research-data-management-policy

# Policy Elements

**Alignment with FAIR Principles**: Ensuring that the policy aligns with FAIR Principles.

There can be three options:

- The policy makes explicit reference to the FAIR Principles and aligns with FAIR.
- The policy does not specifically refer to the FAIR Principles but aligns with FAIR.
- The policy does not address the FAIR Principles explicitly or implicitly.




Open Science Training Handbook https://doi.org/10.5281/zenodo.1212496

# Thank you

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