



GREI Generalist Repository
Ecosystem Initiative

Best practices for sharing data in a generalist repository

December 8, 2022
GREI Collaborative Webinar Series





GREI

Generalist
Ecosystem Initiative

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GREI Collaborative Webinar Series: Data Sharing in Generalist Repositories

Webinar 1: Introduction to Generalist Repositories for NIH Data Sharing | Thursday, September 15

- Learn what a generalist repository is, including key repository features and data sharing use cases.
- Find out how generalist repositories fit into the NIH data sharing landscape & NIH Data Management and Sharing Policy.

Webinar 2: Meet the GREI Generalist Repositories | Wednesday, October 12

- Panel discussion with the 7 generalist repositories participating in the NIH Generalist Repository Ecosystem Initiative (GREI).
- Common features and capabilities across repositories as well as repositories that support specific use cases.

Webinar 3: How to include generalist repositories in your NIH data management and sharing plans | Thursday, November 10

- Learn how to include generalist repositories in data sharing plans as part of your preparation for the new NIH Data Management and Sharing Policy beginning in January 2023.
- This webinar will describe plans to use a generalist repository in a Data Management and Sharing Plan, and preparing for data sharing and reporting

Webinar 4: Best practices for sharing data in a generalist repository: Metadata, data preparation, and reporting | **Today!**

Slides and Recordings available: <https://doi.org/10.17605/OSF.IO/JZU37>



Meet our Speakers



**Sonia
Barbosa,**
*Manager of
Curation,
Harvard
Dataverse*



Eric Olson
*Product
Manager,
Center for
Open Science
(OSF)*



Ida Sim, MD, PhD
*Professor of
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**Sarah
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*Head of
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Engagement,
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**Ana
Van Gulick,
PhD**
*Government
and Funder
Lead, Figshare*



**Anita
de Waard**
*Vice President,
Research
Collaborations,
Elsevier*



Topics covered today

1. **Data preparation:**
 - a. File types, format, documentation, licensing
 - b. Additional considerations for human subjects data
2. **Metadata:** How to generate complete, high quality metadata for your data in a generalist repository
 - a. Leveraging persistent identifiers
 - b. Describing data for discovery and reuse
3. **Reporting:** data metrics, citation, reporting to NIH



Generalist Repository Ecosystem Initiative

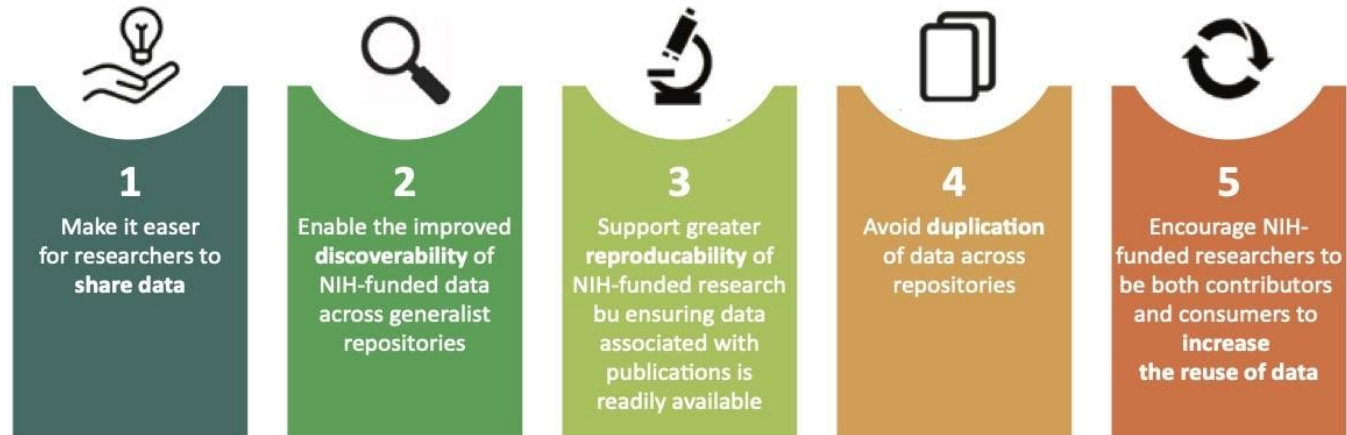


NIH Generalist Repository Ecosystem Initiative

The mission of GREI is to establish a common set of capabilities, services, metrics, and social infrastructure; raise general awareness and facilitate researchers to adopt FAIR principles to better share and reuse data.

This initiative will further enhance the biomedical data ecosystem and help researchers find and share data from NIH-funded studies in generalist repositories.

Goals of the Generalist Repository Ecosystem Initiative





Data Preparation



Data Preparation

- File Types
- File Formats
- Documentation
- Licenses

File Types, Format, Documentation

TOPIC	HARVARD DATAVERSE REPOSITORY	DRYAD	FIGSHARE	MENDELEY DATA	OSF	VIVLI	ZENODO
Size limits	No byte size limit per dataset. Harvard Dataverse Repository currently sets a file size limit of 2.5GB.	300GB/dataset	20GB for free figshare.com accounts. Figshare+ offers storage in tiers beginning at 100GB up to 10TB+ per dataset. System limit of 5TB/file.	10GB per dataset	Projects currently have not storage limit. There is a 5GB/file upload limit for native OSF Storage. There is no limit imposed by OSF for the amount of storage used across add-ons connected to a given project.	If more than 1TB of study data, reach out to us at support@vivli.org so we can help transfer your data.	50GB per dataset, contact us via https://zenodo.org/support for higher limits

Best Practices: File Types and Formats

Ideal:

- Non-proprietary/Open format
- Commonly used in research community
- Unencrypted
- Uncompressed

Other options:

Include information about:

- Version
- Software name and creator, and
- Include additional information in the *readme* file to assist users of the data.

Resources:

<https://www.loc.gov/preservation/digital/formats/>

<https://www.loc.gov/preservation/resources/rfs/TOC.html>

<https://libguides.princeton.edu/c.php?g=102546&p=665864>

Best Practices: Documentation

Ideal:

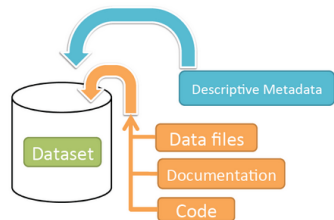
- Codebooks
- Code files
- Measures (including copyright information)
- Readme files

Supplemental:

- Sample consent forms
- IRB approval documentation
- Any additional documentation to assist users in understanding the data collection, organization, and structure of the study

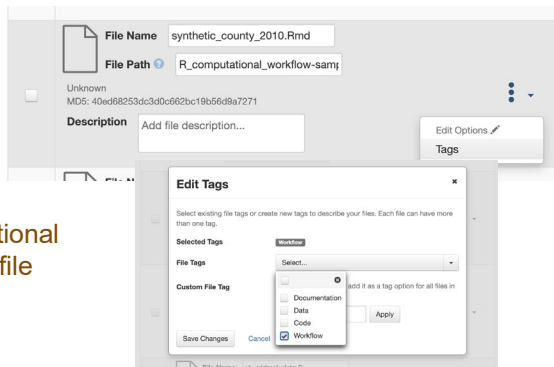
File Types, Format, Documentation

Schematic Diagram of a Dataset in Dataverse 4.0



Container for your data, documentation, and code.

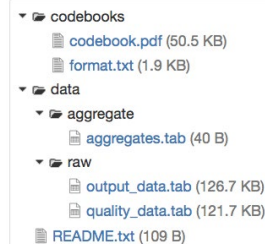
Computational workflow file support



Folder hierarchy support

Change View

Table Tree



Tabular data support

Supported File Formats

Tabular Data ingest supports the following file formats:

File format	Versions supported
SPSS (IPOR and SAV formats)	7 to 22
STATA	4 to 15
R	up to 3
Excel	XLSX only (XLS is NOT supported)
CSV (comma-separated values)	(limited support)

File level access control

Access

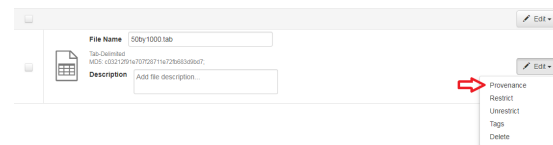
Public (1,784,339)

Restricted (50,591)

Embargoed then Public (154)

Embargoed then Restricted (14)

File level Provenance support



Licensing

TOPIC	HARVARD DATAVERSE REPOSITORY	DRYAD	FIGSHARE	MENDELEY DATA	OSF	VIVLI	ZENODO
Licensing Options	By default, datasets are published in the public domain (CC0). Depositors can change this to apply their own licenses.	CC0	<p>Figshare default licenses supported:</p> <ul style="list-style-type: none"> CC0 1.0 CC BY 4.0 MIT Apache 2.0 GPL v3 GPL v2 <p>Figshare+ also supports:</p> <ul style="list-style-type: none"> CC BY-SA 4.0 CC BY-ND 4.0 CC BY-NC 4.0 CC BY-NC-SA 4.0 CC BY-NC-ND 4.0 BSD 3-Clause" 	<p>Default licenses supported:</p> <ul style="list-style-type: none"> CC0 1.0 CC BY 4.0 CC BY NC 3.0 MIT Apache 2.0 BSD 3-Clause BSD 2-Clause GPL v3 GPL v2 LGPL MPL-2.0 CeCILL CeCILL-B CERN OHL TAPR OHL" 	<p>"The following 14 licenses are available:</p> <p>No License - is a copyright license for the project authors and contributors</p> <ul style="list-style-type: none"> CC0 1.0 CC-By 4.0 MIT Apache 2.0 BSD 2-Clause BSD 3-Clause GPL 3.0 GPL 2.0 Artistic 2.0 Eclipse 1.0 LGPL 3.0 LGPL 2.1 Mozilla 2.0 <p>Other- user defines a license in a .txt file and uploads to the project (not available on registrations or collections)</p>	<p>https://vivli.org/resources/vivli-data-use-agreement/</p>	<p>Content is available publicly under any one of 400 open licences (from opendefinition.org and spdx.org). Restricted and Closed content is also supported.</p>

Best Practices: Licensing

Ideal:

CC0

“No Rights Reserved”



CC0 enables scientists, educators, artists and other creators and owners of copyright- or database-protected content to waive those interests in their works and thereby place them as completely as possible in the public domain, so that others may freely build upon, enhance and reuse the works for any purposes without restriction under copyright or database law.

In contrast to CC's licenses that allow copyright holders to choose from a range of permissions while retaining their copyright, CC0 empowers yet another choice altogether – the choice to opt out of copyright and database protection, and the exclusive rights automatically granted to creators – the “no rights reserved” alternative to our licenses.

When CC0 is not an option, consider:


- Irrevocability of licenses
- Type of material to be licensed
- Nature and adequacy of rights
- Type of License
- Any additional provisions
- How future users will reuse the data
- Special preferences

Resources:

<https://creativecommons.org/licenses/>


<https://opendatacommons.org/licenses/>

Licensing

Dataset Terms 

License/Data Use Agreement


This dataset will be published under the terms specified. We expect that proper credit is given via citation.


Custom Dataset Terms 

CC0 1.0

Custom Dataset Terms

Project (GSP) of Harvard University and the Massachusetts General Hospital


Terms of Use 

Dataset Terms 

License/Data Use Agreement

Our [Community Norms](#) as well as good scientific practices expect that proper credit is given via citation. Please use the data citation shown on the dataset page.

Custom Dataset Terms — the following Custom Dataset Terms have been defined for this dataset.

Terms of Use 

These restrictive terms of use take precedence over any less restrictive use terms that apply generally to Dataverse Network Terms of Use

I request access to data collected as part of the Brain Genomics Superstruct Project (GSP) of Harvard University and the Massachusetts General Hospital, and I agree to the following:

1. I will not attempt to establish the identity of or attempt to contact any of the included human subjects.
2. I will not attempt to link any of the distributed data to any other data that might contain information about the included human subjects.
3. I understand that under no circumstances will the code that would link these data to Protected Health Information be given to me, nor will any additional information about individual human subjects be released to me under these Open Access Data Use Terms.
4. I will comply with all relevant rules and regulations imposed by my institution. This may mean that I need my research to be approved or declared exempt by a committee that oversees research on human subjects e.g., my Internal Review Board or Ethics Committee. Different committees operate under different national, state, and local laws and may interpret regulations differently, so it is important to ask about this.
5. I may redistribute original GSP Open Access data and any derived data as long as the data are redistributed under these same Data Use Terms.
6. I will acknowledge the use of GSP data and data derived from GSP data when publicly presenting any results or algorithms

Best practices with human subjects data*

* [NIH's desirable characteristics for Repositories Part II](#)

Additional Considerations for Repositories Storing Human Data

- A. Fidelity to Consent:** Employs documented procedures to restrict dataset access and use to those that are consistent with p research on a specific disease or condition) and changes in consent.
- B. Restricted Use Compliant:** Employs documented procedures to communicate and enforce data use restrictions, such as pr
- C. Privacy:** Implements and provides documentation of appropriate approaches (e.g., tiered access, credentialing of data users; human subjects' data from inappropriate access.
- D. Plan for Breach:** Has security measures that include a response plan for detected data breaches.
- E. Download Control:** Controls and audits access to and download of datasets (if download is permitted).
- F. Violations:** Has procedures for addressing violations of terms-of-use by users and data mismanagement by the repository.
- G. Request Review:** Makes use of an established and transparent process for reviewing data access requests.



Fidelity to consent

From NIH policy: *Employs documented procedures to restrict dataset access and use to those that are consistent with participant consent (such as for use only within the context of research on a specific disease or condition) and changes in consent.*

The consent form must explicitly describe data sharing and/or future use of research data

- Will participants be asked for consent again each time data is shared?
- Scope of use – which diseases?
- Will data will be combined with other data?

Broad consent example

“Information you provide in this study may be used in the future without your additional informed consent by other researchers to advance scientific research and public health. At this time, we do not know the specific details of these future research projects. These projects may involve bringing together information from this study with information from other studies or sources outside typical research settings.”

Additional examples

- [NIA Informed consent template](#)
- [NIAID Informed consent template](#)
- OSP [Informed Consent for Secondary Research with Data and Specimens](#)

Privacy: Balancing Risks and Benefits

Openness



Maximizing the value of the data collected respects participants' contributions

Privacy



Protecting participant privacy

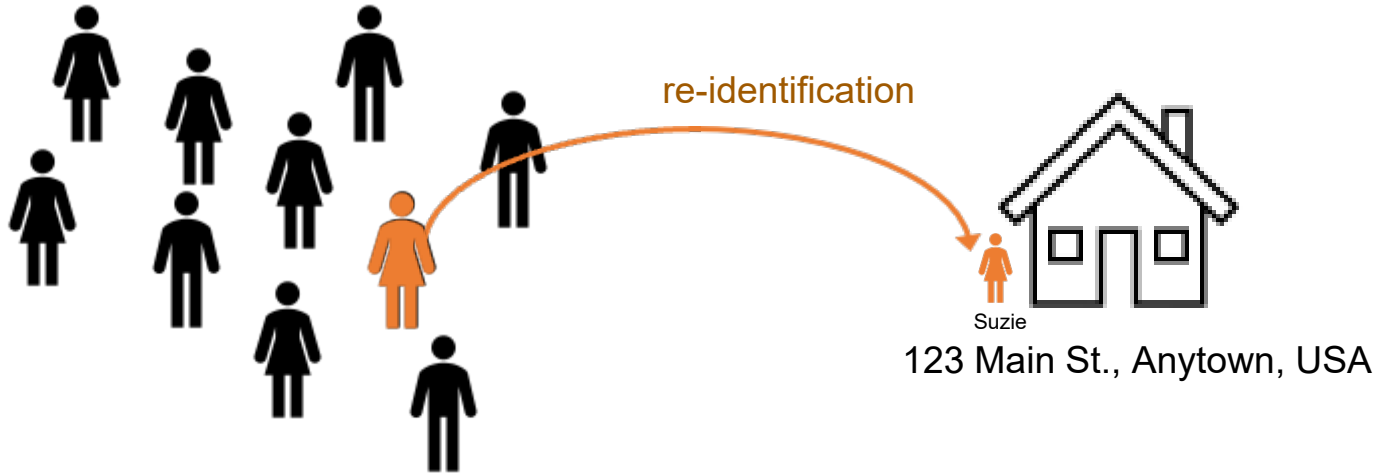


pri·va·cy

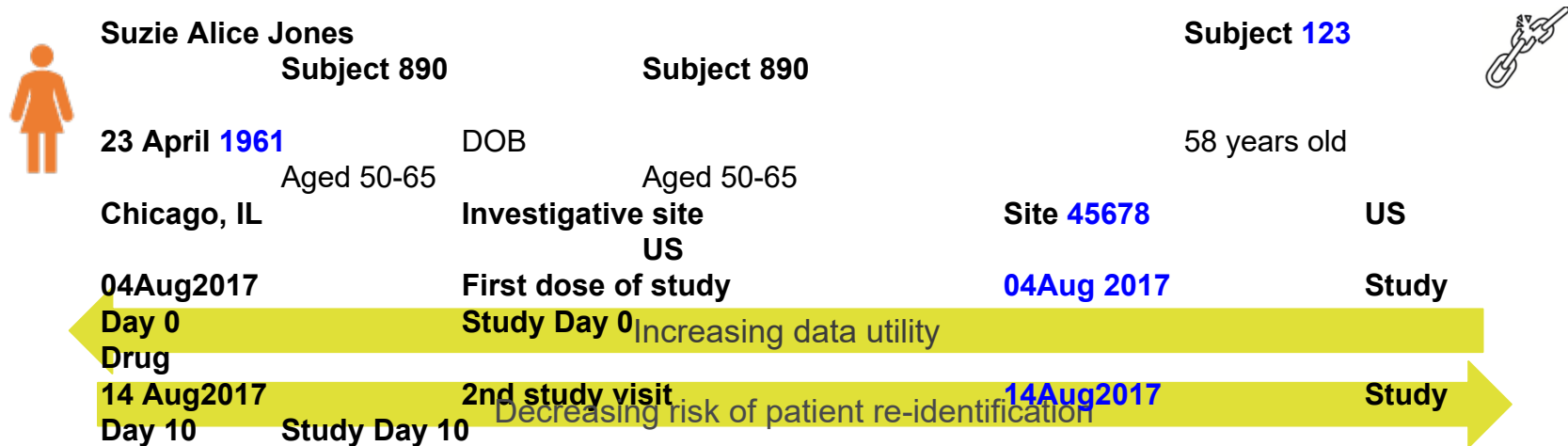
/ˈprɪvəsi/

noun

the state or condition of being free from being observed or disturbed by other people.
"she returned to the privacy of her own home"



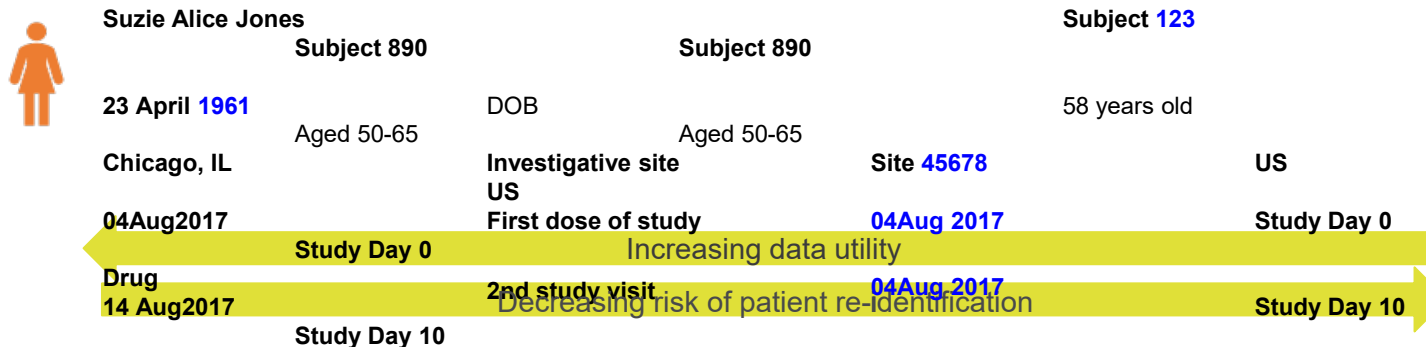
Privacy: Balancing Risk of Re-identification vs Utility



- What level of data transformation does the repository require for reducing risk of re-identification?
- What privacy services or support does your institution offer?

Managed Access

Overall risk of re-identification = level of data transformation + type of data access



Governance: Do data requests go through a managed approval process or can anyone get at the data without restriction?

Technical: Is the data accessible only in a secure enclave or workspace or can users download the data to their own computers?

Metadata



Leveraging persistent identifiers

A persistent identifier is a long-lasting reference to a resource.

Aiming to solve for lost and broken links to important information through both technical and human failures.

Enables access to a resource even if it is moved to different locations or owners.

Creates opportunities for interoperability with many kinds of infrastructure and systems.

Key element in making data FAIR (Findable, Accessible, Interoperable, Reproducible)!

PIDs provide value and insight across research stakeholders

There are PIDs for people, places, and things

PIDs for people (researchers) include ISNIs and ORCID iDs



<https://orcid.org/0000-0002-5989-8244>

PIDs for places (research organizations) include ROR and Funder IDs



<https://ror.org/05d5mza29>

PIDs for things (research outputs/inputs like grants, papers, projects, etc.) include Crossref and DataCite DOIs, IGSNs, and more



<https://doi.org/10.17605/opensf.io/jzu37>

PIDs Enable Connections Across the Research Lifecycle

OSF
Preregistration



Use DOIs to reliably connect research inputs and outputs including data, code, materials, and other supplements generated as well as resulting publications



Investigating variation in replicability: A "Many Labs" Replication Project

Public registration ▾ Updates ▾

- Overview
- Files
- Resources
- Wiki
- Components 0
- Links 0
- Analytics
- Comments 0

Open practice resources ⓘ

- Data
- Analytic code
- Materials
- Papers
- Supplements

Resources

- Data**
https://doi.org/10.17605/OSF.IO/PQF9R
Data and codebook for Many Labs
- Analytic Code**
https://doi.org/10.17605/OSF.IO/TRZAN
Scripts for Many Labs analyses
- Materials**
https://doi.org/10.17605/OSF.IO/WXPU3
Study materials and methods for Many Labs
- Papers**
https://doi.org/10.1027/1864-9335/a000178
Gold open access Many Labs paper published in Social Psychology.
- Supplements**
https://doi.org/10.17605/OSF.IO/WX7CK
Videos, background, commentaries, and other content associated with the Many Labs project.

Contributors
Richard A. Klein, Kate Ratliff, Brian A. Nosek, Michelangelo Vianello, Ronaldo Pilati, Zeynep Cemalcilar, Jesse J. Chandler, Thierry Devois, Elsa Maria Galliani, Mark Brandt, and 34 more ▾

Description
We will attempt to replicate 12 effects in a single experimental package across numerous labs. Variations between lab conditions and sample characteristics will be analyzed to investigate how these factors might influence replication success.

Registration type
OSF-Standard Pre-Data Collection Registration

Date registered
September 15, 2013

Date created
June 14, 2013

Associated project
osf.io/wx7ck

Internet Archive link
https://archive.org/details/osf-registrations-scajyl-v1

Category
Project

Registration DOI
https://doi.org/10.17605/OSF.IO/SCAYL

Publication DOI
https://doi.org/10.1027/1864-9335/a000178

Affiliated institutions

License
CCO 1.0 Universal



Provide attribution to all of your collaborators. Acknowledgement will be synced with their ORCID iD if provided

All preregistrations get a DOI. All relationships with contributors, affiliations, and data are included in the DOI metadata



Verified contributor affiliations, which includes the institution's ROR ID

ROR



ORCID

Connecting Research
and Researchers




DataCite

What can I do to leverage persistent identifiers?

- **Get and use PIDs!**
- Get an ORCID iD! → <https://orcid.org>
- Include relevant related PIDs in the metadata for your software, dataset, and paper PIDs, even if your repository or publisher says they're optional.
- Use repositories that provide PIDs

Describing data for discovery and reuse

- Metadata supports discovery
- Metadata supports reuse

Describing data for discovery and reuse

- All GREI repositories support the DataCite metadata schema and may support others.
- Repositories will typically have some fields with built-in controlled vocabularies and others that are free-text.

Describing data for discovery and reuse

Funding

Granting Organization: *

national institutes of health ?

N/A

National Institutes of Health

Foundation for the National Institutes of Health

National Institute of Nursing Research

Office of Extramural Research, National Institutes of Health

Keywords: Adding keywords improves the findability of your dataset. E.g. scientific names, method type

Methods: How was this dataset collected? How has it been processed?



Paragraph



B

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DRYAD

Describing data for discovery and reuse

- **Title:** Be descriptive. include data type. location. timeframe. and subject*

Related Works

Are there any preprints, articles, datasets, software packages, or supplemental information that have resulted from or are related to this Data Publication?

Article	https://doi.org/10.1371/journal.pone.0238882	remove
Software	10.5281/zenodo.2583172	remove
Dataset	http://purl.org/phylo/treebase/phylovs/study/TB2:S1929	remove

+ add another related work

- Related work **Nevada, USA**

* [Ten simple rules for improving research data discovery | PLOS Computational Biology](https://doi.org/10.1371/journal.pcbi.1009768)

<https://doi.org/10.1371/journal.pcbi.1009768>

** [Disciplinary Metadata | DCC](https://www.dcc.ac.uk/guidance/standards/metadata) <https://www.dcc.ac.uk/guidance/standards/metadata>



Describing data for discovery and reuse

Metadata in your README file

- Use accepted vocabularies for your discipline
- Summary of experimental efforts underlying this dataset
- Dates and locations of data collection (use standardized date formats)
- Description of file structure and contents
- Definitions of all variables, abbreviations, missing data codes, and units
- Links to other publicly accessible locations of the data
- Other sources, if any, that the data was derived from
- Any other details that may influence reuse or replication efforts

https://datadryad.org/stash/best_practices#describe

Reporting



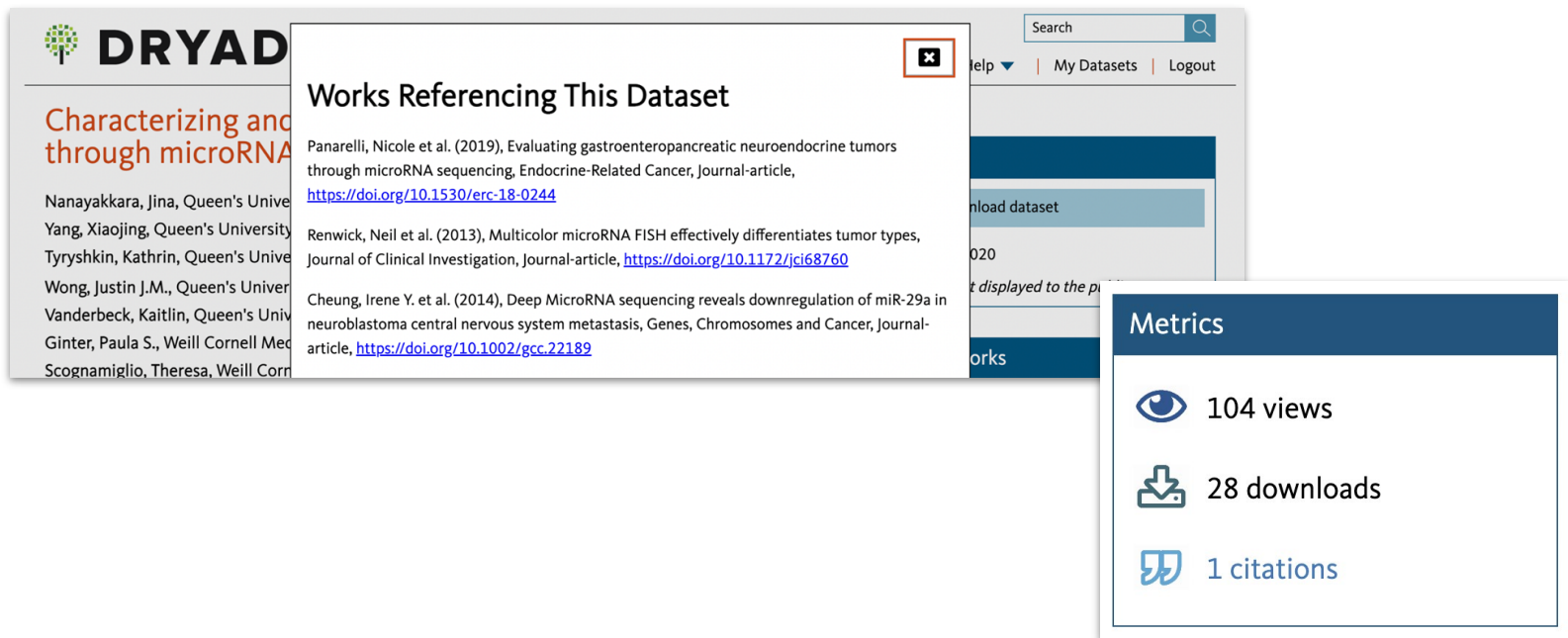
Metrics and reporting

Provide updates on data management and sharing activities in annual progress reports.

<https://sharing.nih.gov/>

<https://grants.nih.gov/grants/rppr/index.htm>

Metrics and reporting



The image shows a screenshot of a DRYAD dataset page. On the left, the DRYAD logo is visible above the title "Characterizing and through microRNA". Below the title, a list of authors and their affiliations is shown: Nanayakkara, Jina, Queen's Univer; Yang, Xiaojing, Queen's University; Tyryshkin, Kathrin, Queen's Unive; Wong, Justin J.M., Queen's Univer; Vanderbeck, Kaitlin, Queen's Univ; Ginter, Paula S., Weill Cornell Med; Scognamiglio, Theresa, Weill Cornell Med.

The main content area is titled "Works Referencing This Dataset" and contains three entries:

- Panarelli, Nicole et al. (2019), Evaluating gastroenteropancreatic neuroendocrine tumors through microRNA sequencing, Endocrine-Related Cancer, Journal-article, <https://doi.org/10.1530/erc-18-0244>
- Renwick, Neil et al. (2013), Multicolor microRNA FISH effectively differentiates tumor types, Journal of Clinical Investigation, Journal-article, <https://doi.org/10.1172/jci68760>
- Cheung, Irene Y. et al. (2014), Deep MicroRNA sequencing reveals downregulation of miR-29a in neuroblastoma central nervous system metastasis, Genes, Chromosomes and Cancer, Journal-article, <https://doi.org/10.1002/gcc.22189>

On the right side of the screenshot, a "Metrics" overlay is displayed with the following data:

- 104 views
- 28 downloads
- 1 citations

Learn More



Generalist Repository Comparison Chart

doi:10.5281/zenodo.3946720

This chart is designed to assist researchers in finding a generalist repository should no domain repository be available to preserve their research data. Generalist repositories accept data regardless of data type, format, content, or disciplinary focus. For this chart, we included a repository available to all researchers specific to clinical trials (Vivli) to bring awareness to those in this field.

<https://fairsharing.org/collection/GeneralRepositoryComparison>

TOPIC	HARVARD DATAVERSE	DRYAD	FIGSHARE	MENDELEY DATA	OSF	VIVLI	ZENODO
Brief Description	Harvard Dataverse is a free data repository open to all researchers from any discipline, both inside and outside of the Harvard community, where you can share, archive, cite, access, and explore research data.	Open-source, community-led data curation, publishing, and preservation platform for CC0 publicly available research data Dryad is an independent non-profit that works directly with: <ul style="list-style-type: none"> researchers to publish datasets utilizing best practices for discovery and reuse publishers to support the integration of data availability statements and data citations into their workflows institutions to enable scalable campus support for research data management best practices at low cost 	A free, open access, data repository where users can make all outputs of their research available in a discoverable, reusable, and citable manner. Users can upload files of any type and are able to share diverse research products including datasets, code, multimedia files, workflows, posters, presentations, and more. With discoverable metadata supporting FAIR principles, file visualizations, and integrations, researchers can make their work more impactful and move research further faster.	Mendeley Data is a free repository specialized for research data. Search more than 20+ million datasets indexed from 1000s of data repositories and collect and share datasets with the research community following the FAIR data principles.	OSF is a free and open source project management tool that supports researchers throughout their entire project lifecycle in open science best practices.	Vivli is an independent, non-profit organization that has developed a global data-sharing and analytics platform. Our focus is on sharing individual participant-level data from completed clinical trials to serve the international research community.	Powering Open Science, built on Open Source. Built by researchers for researchers. Run from the CERN data centre, whose purpose is long term preservation for the High Energy Physics discipline, one of the largest scientific datasets in the world
Size limits	No byte size limit per dataset. Harvard Dataverse currently sets a file size limit of 2.5GB.	300GB/dataset	Soft limit of 20GB/file for free accounts. System limit of 5000GB/file. Unlimited storage of public data but 20GB storage for private data for free accounts. Email info@figshare.com to have upload and storage limits raised.	10GB per dataset	Projects currently have not storage limit. There is a 5GB/file upload limit for native OSF Storage. There is no limit imposed by OSF for the amount of storage used across add-ons connected to a given project.	If more than 10GB per study data, reach out to us	50GB per dataset, contact us via https://zenodo.org/support for higher limits
Storage space per researcher	1 TB per researcher	No limit	No limit	No limit	No limit	No limit	No limit
Persistent, Unique Identifier Support	DOI, Handle	DOI	DOI	DOI	DOI	DOI	DOI

Common features and unique features

Common:
 Core Metadata
 Persistent Identifiers
 Discoverable
 Flexibility
 Open access, FAIR
 Metrics

Unique:
 Output types
 Storage, size limits
 Licenses
 Review
 Controlled Access
 Visualization
 Costs

<https://doi.org/10.5281/zenodo.3946719> (Updated version 2!)



Previous GREI Collaborative Webinars

GREI Collaborative Webinar Series on D... Files Wiki Analytics Registrations



GREI Collaborative Webinar Series on Data Sharing in Generalist Repositories

Contributors: [Amanda Staller](#), [Ana Van Gulick](#), [Nicole Pfeiffer](#)

Affiliated institutions: [Center For Open Science](#)

Date created: 2022-10-07 01:37 PM | Last Updated: 2022-11-23 05:29 AM

Identifier: DOI 10.17605/OSF.IO/JZU37

Category: Project

Description: *Recordings and slides from the GREI collaborative webinar series.*

License: [CC-BY Attribution 4.0 International](#)

Wiki

GREI Collaborative Webinar Series on Data Sharing in Generalist Repositoires

Access resources from a series of presentations and panel discussions by generalist repositories to learn about available repository resources and best practices for sharing NIH-funded research.

Presented by the members of the NIH Generalist Repository Ecosystem Initiative (GREI): Dryad, Dataverse, Figshare, Mendeley Data...

[Read More](#)

**Slides and videos
available**

**More GREI webinars
coming in 2023!**

<https://doi.org/10.17605/OSF.IO/JZU37>





NIH National Institutes of Health
Office of Data Science Strategy

Registration open!

VIRTUAL GENERALIST REPOSITORY ECOSYSTEM INITIATIVE (GREI) WORKSHOP

January 24-25, 2023

Day 1: 11 a.m.–4 p.m. EST | Day 2: 11 a.m.–3:30 p.m. EST

<https://datascience.nih.gov/news/grei-workshop-january-24-25-2023>



GREI Workshop

Agenda

Tuesday, January 24	
11 – 11:05 a.m.	Welcome
11:05 – 11:15 a.m.	Introduction to GREI and Workshop Logistics
11:15 – 11:25 a.m.	Welcome from ODSS, GREI Program
11:25 a.m. – 12:20 p.m.	Day 1 Keynote
12:20 – 12:30 p.m.	Break
12:30 – 2 p.m.	Panel Session: Research Community Perspectives on Data Sharing
2 – 2:15 p.m.	Break
2:15 – 3:45 p.m.	Day 1 Interactive Training Session: Using generalist repositories to share data - exploring specific use cases and repository functionality
3:45 – 4 p.m.	Day 1 Wrap-up

Wednesday, January 25	
11 – 11:05 a.m.	Day 2 Welcome
11:05 a.m. – 12:45 p.m.	Panel Session: NIH stakeholder perspectives on generalist repositories in the data sharing landscape
12:45 – 1 p.m.	Break
1 – 1:50 p.m.	Day 2 Keynote
1:50 – 2 p.m.	Break
2 – 3:20 p.m.	Day 2 Interactive training session: Discovering and reusing data in generalist repositories
3 – 3:30 p.m.	Closing

Times are noted in Eastern Standard Time

<https://datascience.nih.gov/news/grei-workshop-january-24-25-2023>





Questions for our speakers

Contact the GREI program
at GREI@nih.gov

