Ethical Open Science



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(updated from slides by Bethany Allen & Harriet B. Drage)

Learning Objectives

- 1. Think and discuss what open science means
- 2. Understand the basics of FAIR and CARE
- 3. Learn where can data can be archived and while considering FAIR and CARE principles





Breakout session

Discuss

Discuss questions in small groups – 10 minutes

Answer

Write answers – 5 minutes

Read

Discuss answers with other groups – 10 minutes



Breakout session questions

- 1. Why is open science important?
- 2. What information is important to archive in a findable, accessible, interoperable, and reproducible way?
- 3. What are some repositories where you can archive open science data?
- 4. What are some ethical considerations with open science data?



Why open science?

- 1. Transparency
- 2. Reproducibility
- 3. Accessibility
- 4. Collaboration
- 5. Equity
- 6. Efficient workflows
- 7. Education and outreach







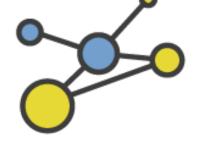






Accessible











Reusable



Findable

- F1. (Meta)data are assigned a globally unique and persistent identifier
- F2. Data are described with rich metadata (defined by R1 below)
- F3. Metadata clearly and explicitly include the identifier of the data they describe
- F4. (Meta)data are registered or indexed in a searchable resource





What is **FAIR?**

It is a set of principles

Interoperable

- I1. (Meta)data use a formal, accessible, shared, and broadly applicable language for knowledge representation.
- I2. (Meta)data use vocabularies that follow FAIR principles
- I3. (Meta)data include qualified references to other (meta)data



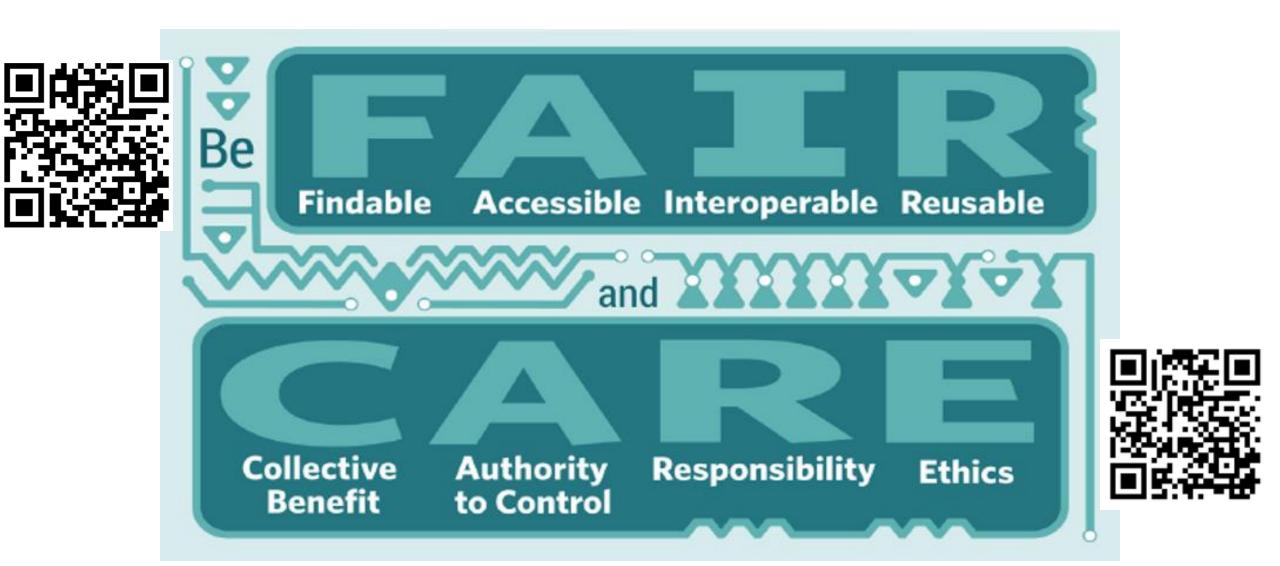


Accessible

- A1. (Meta)data are retrievable by their identifier using a standardised communications protocol
- A1.1 The protocol is open, free, and universally implementable
- A1.2 The protocol allows for an authentication and authorisation procedure, where necessary
- A2. Metadata are accessible, even when the data are no longer available

Reusable

- R1. (Meta)data are richly described with a plurality of accurate and relevant attributes
 - R1.1. (Meta)data are released with a clear and accessible data usage license
- R1.2. (Meta)data are associated with detailed provenance
- R1.3. (Meta)data meet domain-relevant community standards





DAT	ГА	PR	IN	CI	PΙ	FS
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	INDIG	ENOUS	MAINSTREAM			
New Zealand Indigenous Data Sovereignty Principles	Australia Indigenous Data Sovereignty Protocols	United States Indigenous Data Governance Principles	Canada Indigenous Data Governance Principles	Open Data Charter Principles	FAIR Principles for Data Management and Stewardship	STREAM Properties for Industrial and Commoditized Data
Authority	Self-Determination	Inherent Sovereignty	OCAP®	Open By Default	Findable	Sovereign
Relationships	Available and Accessible	Indigenous Knowledge	Indigenous Knowledge	Timely and Comprehensive	Accessible	Trusted
Obligations	Collective Rights and Interests	Ethics	Methodology and Approaches	Accessible and Usable	Interoperable	Reusable
Collective Benefit	Accountability	Intergenerational Collective Wellbeing	Evidence to Build Policy	Comparable and Interoperable	Reusable	Exchangeable
Reciprocity	Exercise Control	Relationships	Ethical Relationships	For Improved Governance & Otizen Engagement		Actionable
Guardianship			Data Governance	For Inclusive Development and Innovation		Measurable

People oriented principles Purpose oriented principles Data oriented principles Carroll, S, et al. 2020. The CARE Principles for Indigenous Data Governance. *Data Science Journal*



Where to archive?



Dryad, Zenodo, FigShare, the Open Science Framework (OSF), Pangaea, institutional and funding body repositories...







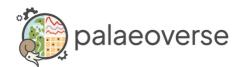
PANGAEA.

Data Publisher for Earth & Environmental Science

General data: PBDB and Neotoma (occurrence data), MorphoSource, MorphoBank...







Where to archive?

But to consider:

- Longevity
- Cost
- Capacity
- Accessibility
- Discoverability
- Citability
- Version control
- Licensing



