

Managing Your Research Data

Best Practices in Research Data Management for the Biological Sciences

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Introduction

- Data Management Plans
- Data structure and formatting
- File management
- Data sharing & backup

Managing Your Research Data

Data Management Plans

What is a Data Management Plan?

A short document (2-3 pages) which contains information about:

- Data sources
- Data input methods (validation)
- Back up strategies (Consider & select option(s))
- Plans for data sharing (Suitable repository & appropriate access controls – FAIR data principles)
- Ethical/legal restrictions (e.g. Patient Data)
- Who is responsible for the data

Researcher needs to write a DMP before the project begins

Why do I need a Data Plan?

- To protect your science
- Re-usable data
- Reproducible better science
- To help your future you and your current colleagues
- Major funders require it
- University policy
- Legal requirements e.g. use of personal data or confidentiality agreements



[University of Cambridge](#)

[Research Data Management Policy Framework](#)

University Research Staff and Students are responsible for:

PLANNING

18. Principal Investigator(s) should establish and maintain clear research data management responsibilities within their research group to ensure good data management is practised throughout the project and by all group members. In the case of collaborative projects, the Principal Investigators must jointly agree how data is managed and maintained, sometimes across different institutions.
19. Preparing a Data Management Plan (whether as a research group or individual), in accordance with guidance provided by the [University of Cambridge](#) and the [Digital Curation Centre](#) (DCC). If funders require a Data Management Plan, such plan needs to be prepared according to [funders' requirements](#) and should also be updated at project close to record how data has been managed, archived and, where appropriate, shared. This is good practice for all projects.

[Digital Curataion Centre – Data Management Plans](#)

[UoC – Data Management Plan Support Service](#)

[UoC – Funder's Policies](#)

The Data Protection Act 2018

The legislation imposes requirements for use of personal data, but most research will be subject to one of two exemptions:

1) Research purposes – used where:

- The standard provisions would seriously impair research
- No damage or distress to data subjects
- No individual decision-making about data subjects
- Safeguards are in place

2) Academic expression - used where:

- Complying with the standard provisions would be incompatible with the academic purpose
- There will be a publication in the public interest



Patient Identifiable Data

Has more data protection requirements

- Even more sensitive
- Protects patients living and deceased unlike Data Protection Act which focuses upon living
- Very seldom allowed to breach except in interests of patients health and well-being

[NHS Digital - Data security and information governance](#)

Data protection requirements for researchers

- Know and communicate your legal basis (research)
- Be transparent with data subjects (research)
- Process accurately and only what you need (research)
- Keep personal data secure (research)
- Process fairly, considering any ethical risks to the data subject (research)
- Comply with institutional accountability processes, e.g. ethical review (research and academic expression)



Storage of Personal data

- Personal data may only be used under the research exemption if appropriate security measures are taken
- Ideally this will be prompt anonymization or pseudonymisation
- Ensure that portable systems or devices are fully encrypted
- Ensure physical security for hard copy data.

More about storage and backup later in the course

Handling Personal data

- If possible, don't collect it!
- Gain informed, preferably open and written, consent. See UK Data Service for examples.
- Anonymise data - Remove identifiers, Aggregate results, Generalise a variable, Remove outliers
- Use managed access repositories

Where to go for further help and advice

- Your local IT support desk
- [Office of Scholarly Communications \(UoC\)](#)
- [Data Champions \(UoC\)](#)
- [University Information Services \(UoC\)](#)
- [University Research Ethics website \(UoC\)](#)
- [NHS Health Research Authority](#)
- [UK Data Service - The Data Protection Act and GDPR](#)



Further online courses

- [University of Edinburgh - MANTRA](#)
- [Foster Open Science e-learning portal](#)
- [UK Data Service Training](#)



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