



Managing Research Data

Principles and practices

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Centre for eResearch

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Valuing inclusion

Ensuring all individuals feel respected, accepted, and valued.

- Manaakitanga - show respect, care and support for others
- Whanaungatanga – foster an environment where all in our community have a place
- Kotahitanga – built unity and partnership
- Kaitiakitanga - recognise our responsibilities as kaitiaki (guardians) to protect and respect our environment, traditions, knowledge, culture, languages and other taonga.



<https://www.auckland.ac.nz/en/on-campus/life-on-campus/code-of-conduct.html>

1. Introductions



...and tell us what question you are hoping to have answered in this workshop.

What are research data?

The evidence that underpins the answer to a research question and can be used to validate findings regardless of its form (e.g., print, digital, or physical).

Data or artefacts, cultural taonga, research evidence, and digital representation of a physical item used in research.

samples, interviews, images, surveys, observations, audio/visual recordings, medical records, maps, instrument data, spreadsheets, bibliographies, manuscript annotations...

Is software/code research data?

Maybe, it depends.

Software/code may be the focus or by-product of the research.

Does the software or code support:

- **Reproduction** - enabling others to find, access & run exactly same software, inputs & computational environment to verify/validate your results.
- **Replication** - using *similar* inputs, tools, environments, to arrive at mostly the same outputs and conclusions to justify the results.

[The Turing Way](#) is a handbook to reproducible, ethical and collaborative data science.

What is research data management?

Process of planning and undertaking the collection, organisation, management, storage, backup, preservation and sharing of data before, during and after the project.

Understanding

Integrity

Collaboration

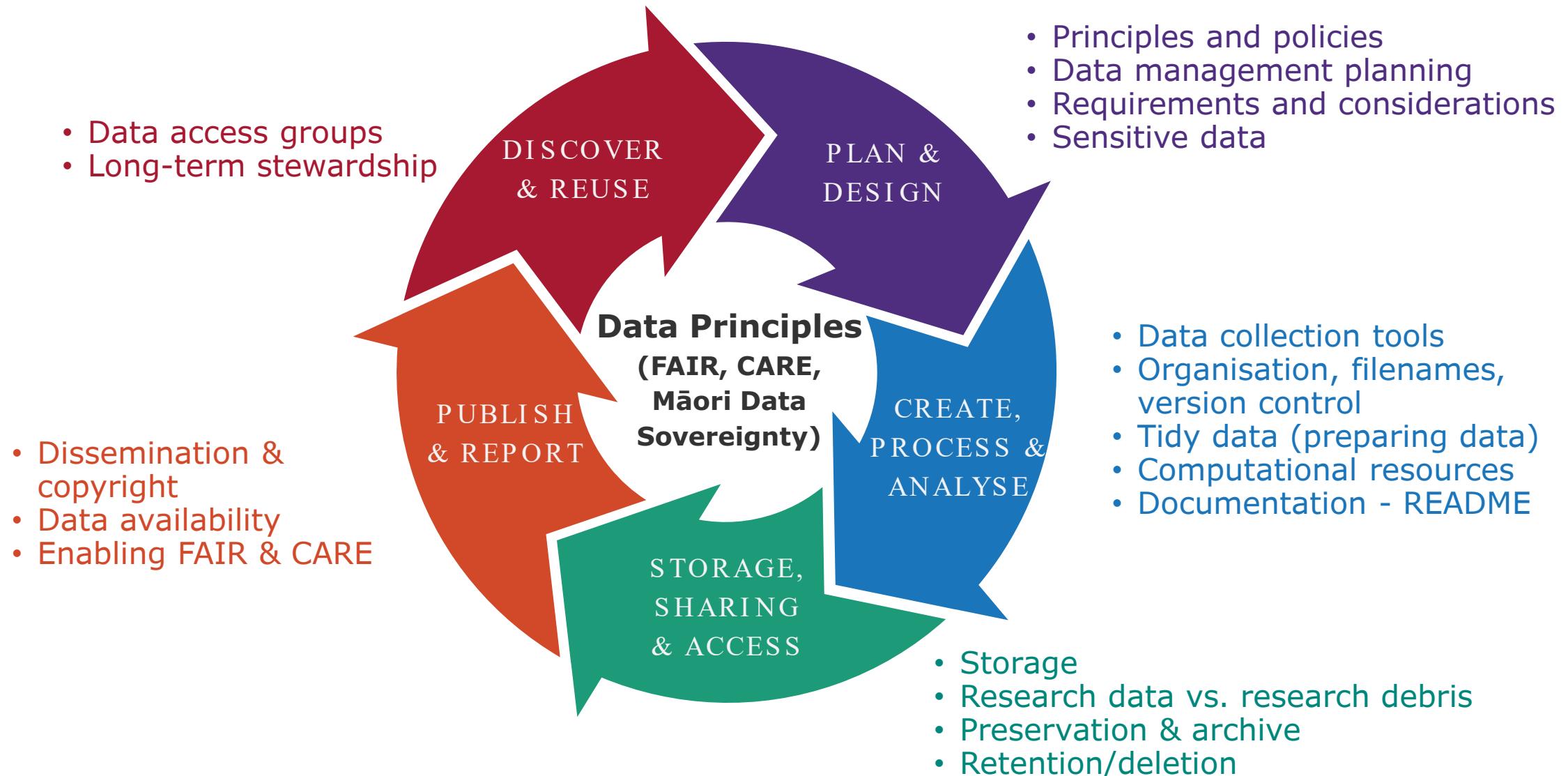
Impact

Other environments



[A curated list of RDM resources](#) for researchers and organisations (Mannheim University, Germany)

Research data management



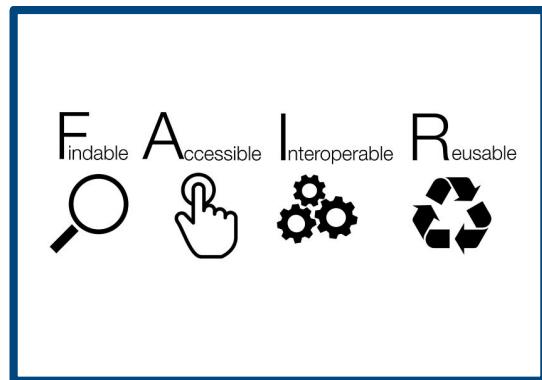
Plan and Design

Plan for data management throughout the research data lifecycle.

- Principles and policies
- Data management planning
- Requirements and considerations
- Managing sensitive data

A culture shift for RDM

What has driven changes over the last decade?



Expectations

- "...maximise knowledge output from funding"
- Reduce **duplication** and increase **reuse** of data
- **FAIR principles**
(Findable, Accessible, Interoperable, Reusable)
- **Reproducibility**



Technology

- Increased capacity to generate, store & work with very large datasets,
- Cloud computing
- Lower computing costs
- **Digitisation**



Data sovereignty

"... becoming a **Māori Data Sovereignty** organisation" and **CARE** - data principles



Privacy & security

- **Legal, ethical and protective security**
- Managing risk

Researchers want to do the right thing but want clarity/direction on best practices, available services & support.

Policies related to research data

National

- Funder and publisher policies, e.g., [MBIE Open Research policy](#)
- [Trusted Research – Protective Security Requirements guidance](#)
- [Research Charter for Aotearoa New Zealand](#)
- [Royal Society Professional Code of Conduct](#)

Institutional (University of Auckland, as an example)

- [Research Data Management Policy](#) and [guidance](#)
- [Research Code of Conduct](#) (new Research Integrity Policy under review)
- [IP created by staff and students Policy](#) (under review)
- [Privacy Policy](#)
- Māori Research Policy (in development)

What does an RDM policy look like?

A **research data management policy** sets out researcher and research student responsibilities for the management, preservation and sharing of research data.

- Common elements:
 - Data management planning
 - Support researchers to be “as open as possible, as closed as necessary”
 - Enable long-term stewardship
- Usually paired with guidance on how to implement, e.g., apply governance and storage on a project-by-project basis

... / Research and innovation / Research data management / Research Data Management Policy

Research Data Management Policy

Application

This policy applies from the commencement date (1 July 2023) to all **research staff**, **students**, **supervisors** and other members of the **University community** that are involved in the management of **research data**.

Purpose

To articulate the responsibilities of the University community for the management of research data. These responsibilities help to ensure that research data is managed in ways that are consistent with:

- international standards for **FAIR data** and open research that are increasingly required by funders, data providers and publishers
- the University's obligations under Te Tiriti o Waitangi and commitment to becoming a **Māori data sovereignty** organisation,
- the **CARE principles** for the governance of indigenous data, including **Pacific data**, and
- legal, ethical and protective security requirements for research data.

Policy

University responsibilities

The University is responsible for:

1. Defining University roles and responsibilities for the management of research data.
2. Communicating the requirements of this policy and facilitating its adoption through the provision of training and guidance to researchers.
3. Providing the necessary infrastructure and services to enable researchers to meet their responsibilities for research data throughout the research data lifecycle.

Researcher responsibilities

Researchers are responsible for:



**2. What policies and guidance on RDM
are you required to follow?**

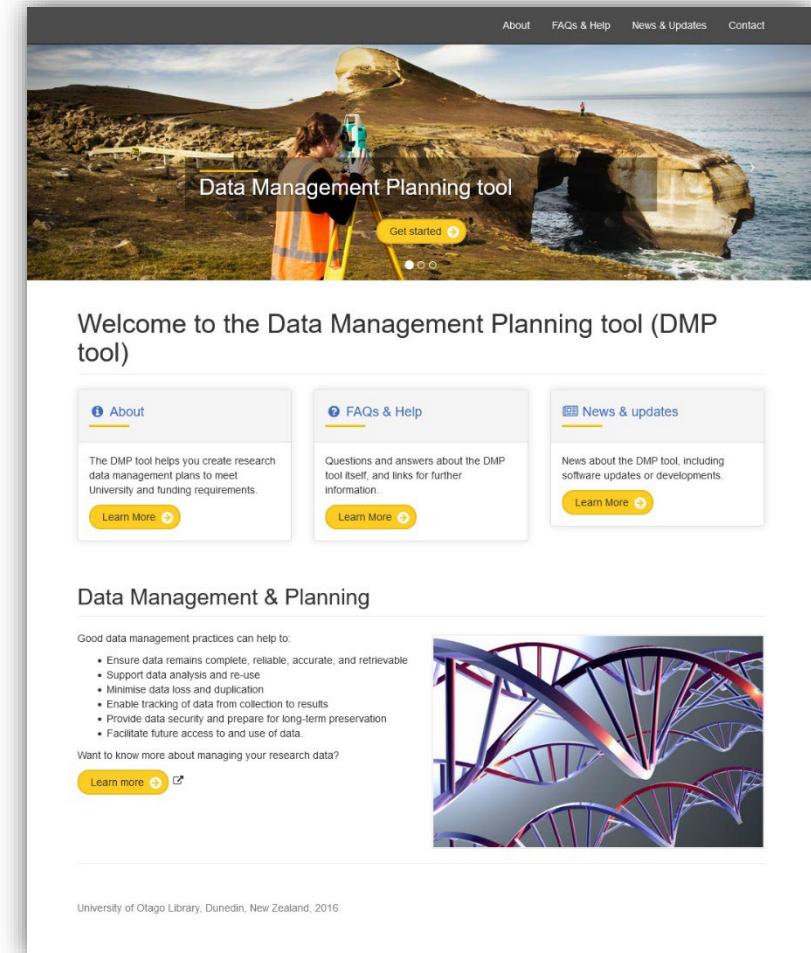
Data Management Planning

Data Management Planning is about preparing for data management across the research data lifecycle.

- Institutional, Ethics Committee or Funder requirement?
 - MBIE, NIH, Wellcome Trust
 - HDEC, University RDM Policy
- Risk-orientated approach
- Project specific
- Prompts conversations, captures decisions, clarifies roles and responsibilities and helps you to align with University policies and processes



[Checklist for a Data Management Plan from the Digital Curation Centre](#)



The screenshot shows the homepage of the Data Management Planning tool (DMP tool). At the top, there's a navigation bar with links for About, FAQs & Help, News & Updates, and Contact. Below the navigation is a large header image featuring a person in high-visibility gear using surveying equipment on a coastal cliffside. The text "Data Management Planning tool" is overlaid on the image, along with a "Get started" button. The main content area has a light blue background. It starts with a "Welcome to the Data Management Planning tool (DMP tool)" message. Below this are three cards: "About" (describing the tool's purpose), "FAQs & Help" (with a link to learn more), and "News & updates" (with a link to learn more). Further down, there's a section titled "Data Management & Planning" with a list of benefits and a "Learn more" button. To the right of this text is a stylized DNA helix graphic.

Data Management Planning

Document decisions about:

- **Project information** - purpose, people, roles & responsibilities
- **Requirements and considerations** - ethical, legal, sovereignty, funder, etc.
- **Data** - collection, organisation & sharing, including access restrictions
- **Sharing and access** - storage locations, retention/ deletion, long term governance
- **Publication** - enabling FAIR

The screenshot shows a web-based application for creating or updating a Data Management Plan (DMP). At the top, there's a navigation bar with tabs for HOME, PLAN (which is active), MANAGE, DATA RECORD, PUBLISH, and a search bar. Below the navigation is a sidebar with links to 'Overview', 'Project information', 'DMP Permissions', 'Requirements and Considerations' (which is highlighted in blue), 'Data', 'Sharing and access', 'Publish and Report', and 'Services'. The main content area is titled 'Data Management Plan' and includes a sub-section 'Nau mai, haere mai, welcome. You are about to create or update your Data Management Plan (DMP)'. It explains what DMPs are and how they are used. A note at the bottom states: 'Note: Researchers are responsible for creating and maintaining a DMP for sensitive or restricted data under the University's Research Data Management Policy'. At the bottom of the page are buttons for 'Previous', 'Next', 'Save', 'Save & Close', and 'Close'.



ResBaz
RESEARCH BAZAAR

Data Management Planning
Wednesday 10 July, 9am-10am

Data governance

...enables answers to

- Is the data **reliable** (quality) for a given use?
- What is its **value** and associated **risks**?
- Who has **access**?
- Where is the data (**location**), and what happens if it is moved or changed?
- Who and what processes are keeping data **protected**?
- Is access **control** appropriate (security classification, and authority to control)?

...involves

- people - **roles and responsibilities**
- **technologies, systems and tools**
- **processes and controls** to support the consistency, integrity, usability and access
- **policies, procedures and standards** to support clarity and compliance - legal, regulatory, ethics, sovereignty
- **data quality**, including metadata and information security



3. Data management planning

Legal, ethical, sovereignty constraints

Researchers should ensure that **legal, ethical, data sovereignty, protective security and commercial constraints** relating to research data are considered prior to data collection and adhered to throughout the research data lifecycle.

- Constraints will inform how data are collected/gathered, stored, shared and governed throughout the data lifecycle.
- Even if none of the constraints mentioned above apply to specific project, there will likely be values-based considerations.

Legal constraints

Privacy principles covered by the Privacy Act 2020

National Ethics Advisory Committee

Principles for the safe and effective use of data and analytics, 2018

Stats NZ & the Privacy Commission

International: GDPR & HIPAA



Further details >> <https://www.privacy.org.nz/assets/New-order/Resources-/Publications/Guidance-resources/Privacy-Act-2020-information-sheets-full-set.pdf>

De-identifying data

Identifiable

Data that directly or indirectly identifies an individual or business.

De-identified

Data which has had information removed from it to reduce risk of spontaneous recognition.

Confidentialised

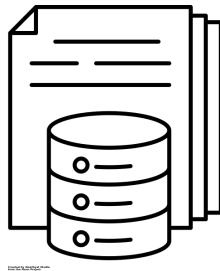
Data which has had statistical methods applied to it to protect against disclosing unauthorised information.



[Degrees of identification in data](#) – From data.govt.nz (Creative Commons Attribution 4.0 International)

More legal considerations

- Contracts
- Intellectual Property / commercialisation
- Copyright of incoming data
- Export controls



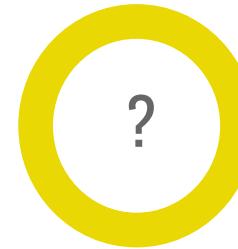
My fancy data



WIKIPEDIA
The Free Encyclopedia



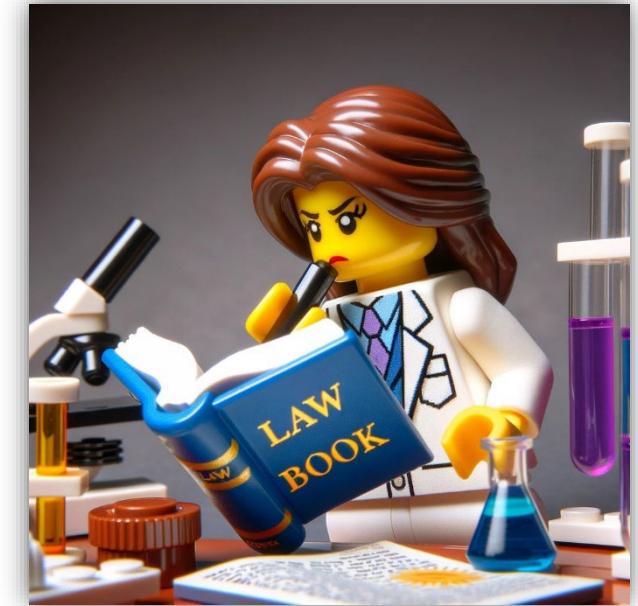
External data
source(s)



New data set



Created by Myly
from Noun Project



<https://doi.org/10.5281/zenodo.11147887>

Data sharing agreements

Where research is shared with third parties, intellectual property rights, plans for data preservation and sharing, and legal responsibilities should be agreed in a formal **data sharing agreement**.

- Formal contract sets out:
 - sets out and agrees on the purpose of the data sharing and expected outcomes
 - describes what will happen to the data at each stage (how the data will be transferred and stored)
 - sets standards and helps all the parties to be clear about their respective roles (access restrictions, stewardship)
- Parties demonstrate their accountability to legal, ethical, data sovereignty, etc. requirements.



[More information on data sharing agreements](#) from the UK Information Commissioner's Office

Ethical considerations

Ethics applications, including pre-screening review, **benefit** from being able to demonstrate consideration of:

- What data needs to be collected/gathered, for what purpose, and from whom?
- How will you protect the identify of participants if required?
- How, by whom and when will data collection/gathering occur?
- Where and for how long will data be kept?
- With whom, how and for what purpose can it be shared?
- How will access be restricted and on whose authority will this be controlled?
- Have you gained consent for data preservation and sharing?

Reconsider expectation to *destroy* or store *indefinitely* digital research data.

Indigenous data sovereignty

Indigenous Peoples have inherent rights and responsibilities to **Indigenous data**.

- [CARE principles for indigenous data sovereignty](#)
Collective Benefit, Authority to Control, Responsibility, and Ethics
- [Māori Data Sovereignty principles](#)
Rangatiratanga (Authority), Whakapapa (Relationships), Whanaungatanga (Obligations), Kotahitanga (Collective benefit), Manaakitanga (Reciprocity), Kaitiakitanga (Guardianship)
- [Pacific Data Sovereignty](#)

Consider early as these impact the funding application, planning ethics application, consent, storage, metadata, sharing, and publishing of research findings and data throughout the research data lifecycle.



[Global Indigenous Data Alliance](#)



[Māori Data Sovereignty](#)
Thursday 11 July, 3pm-4pm

Sensitive data

What data might need more **security, protection or access restriction?**

- Data from or about - human participants, health/clinical providers, environment, indigenous people, culture, politics, industry, defence/national security, animals ... ?
- Data may become sensitive - unintended capture or context of use, or attitudes may change over time and place.
- Sensitive data is common.
- Data classification helps to understand constraints & meet requirements.

Consider impact on how data is governed, captured, stored, moved and shared, and future stewardship, etc.



4. Research data classification

Sensitive data

Available resources:

- [Sensitive data guide](#) (ARDC)
- [Data confidentiality principles & methods](#) (data.govt.nz)
- [NEAC National Ethical Standards](#)
- HDEC [template](#) for data/tissue management plan
- [Te Ira Kāwai, the Auckland Regional Tissue Bank](#) guidance for collection and storage of human tissue for research



Local resources and support?

- Ethics and Integrity
- Māori Responsiveness
- REDCap
- Genomics support
- Health Research / Clinical Trials



5. What do you find most challenging about managing sensitive data?

Collect, process & analyse data

Plan and document data collection & processing so that the end result could be interpreted, replicated from the raw data and reused by others.

- Data collection software & tools
- Organisation, filenames, version control
- Data processing – Tidy Data
- Computational resources
- Documentation – metadata & README

Data collection software & tools

- **Use University-supported software or tools, whenever possible.**
These applications are often security tested and approved ('Authority to Operate')
- Always consider where and with whom your data is being sent, stored, or shared during collection and processing.
- Is data backed up and is it secure?

Activity	Approved tools (examples)
Participant surveys	REDCap Qualtrics
Transcription of audio files	MS Word MS Teams Zoom



Digital transcription tools

Thursday 11 July, 10am-11am

Intro to Qualtrics

Thursday 11 July, 3pm-4pm

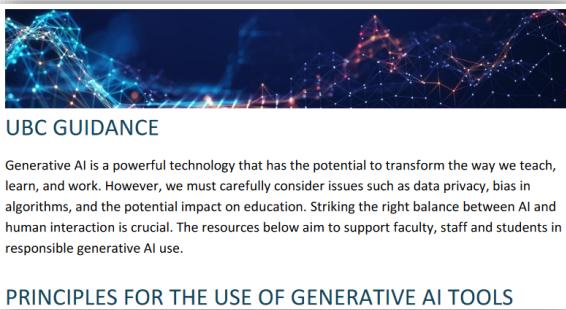
An overview of REDCap

Thursday 11 July, 11am-12pm

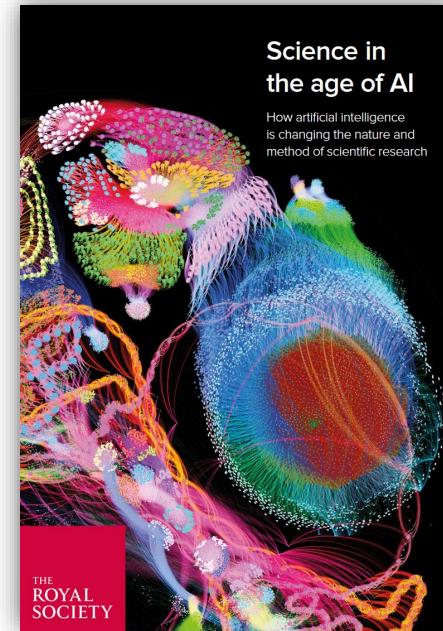


Using AI or AI-enabled services

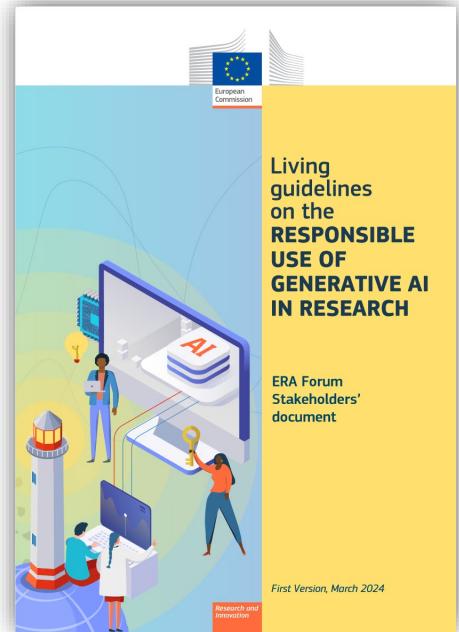
- What are appropriate uses?
- What types of data are appropriate as AI inputs?
- Where does the data go and what happens to it?
- Do I have participant consent?
- How do I cite my use of AI?
- Am I required to follow an institutional policy?



[University of British Columbia Guidance](#)



[Royal Society
\(2024\)](#)



[EU guidelines
\(March 2024\)](#)



6. Use of AI with research data

Organisation

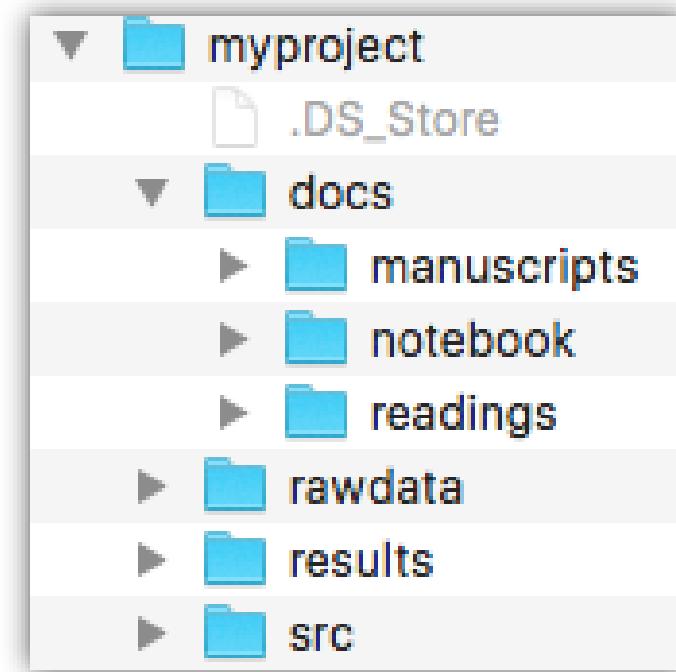
- What types of data, what file formats?
- How much? $raw + (analysed * no.\ analyses) + (backup * redundancies)$
- Will it grow/accumulate?
- Will it change over time?
- How will you organise it?
- Where will you store it?
- How will you document /describe it?



Further information: [Organising data \(UK Data Service\)](#)

Project-based Organisation

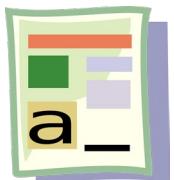
- CLEAR. CONCISE. CONSISTENT.
- Folder hierarchy
 - short, descriptive folder names
 - avoid overlapping categories
 - limit size and depth of folders
- Consistent strategy prevents confusion
- Things are easy to find and to sort
- Document your strategy
- Set up and use databases if necessary



Further information: [Project structure by Danielle Navarro](#)

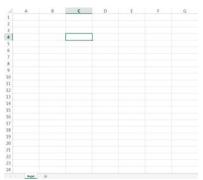
File Naming

- Create a template and document it
- Short, descriptive and use only important fields
- Avoid spaces or special characters and ambiguity



20170310-tmr-literature-review.docx
[date]-[creator]-[subject].[ext]

arthnz-rat-rbw-food-weights.xlsx
[project]-[animal model]-[creator]-[data type].[ext]



UCollege_AndersonM_Ped-Resp-Infection-Genomic-Determinants_Biosketch_20160125.pdf
[CTSA]_[InvestigatorLastNameFirstInitial]_[ProtocolShortTitle]_[Document]_[YYYYMMDD].[ext]



teko-van-kuyk_pineapple-41-white-purple-black_35x50_2017
[artist-name]_[artworks-name]_[length-X-height(depth in case of sculpture)]_[date or year]

fr3s-140623-129C-2653-w.jpg
[studysite,depth of water]-[yyymmdd]-[tile#,treatment]-[photo#]-[photo coverage].[ext]

Version Control

Originally for software development, now used by the data science community.

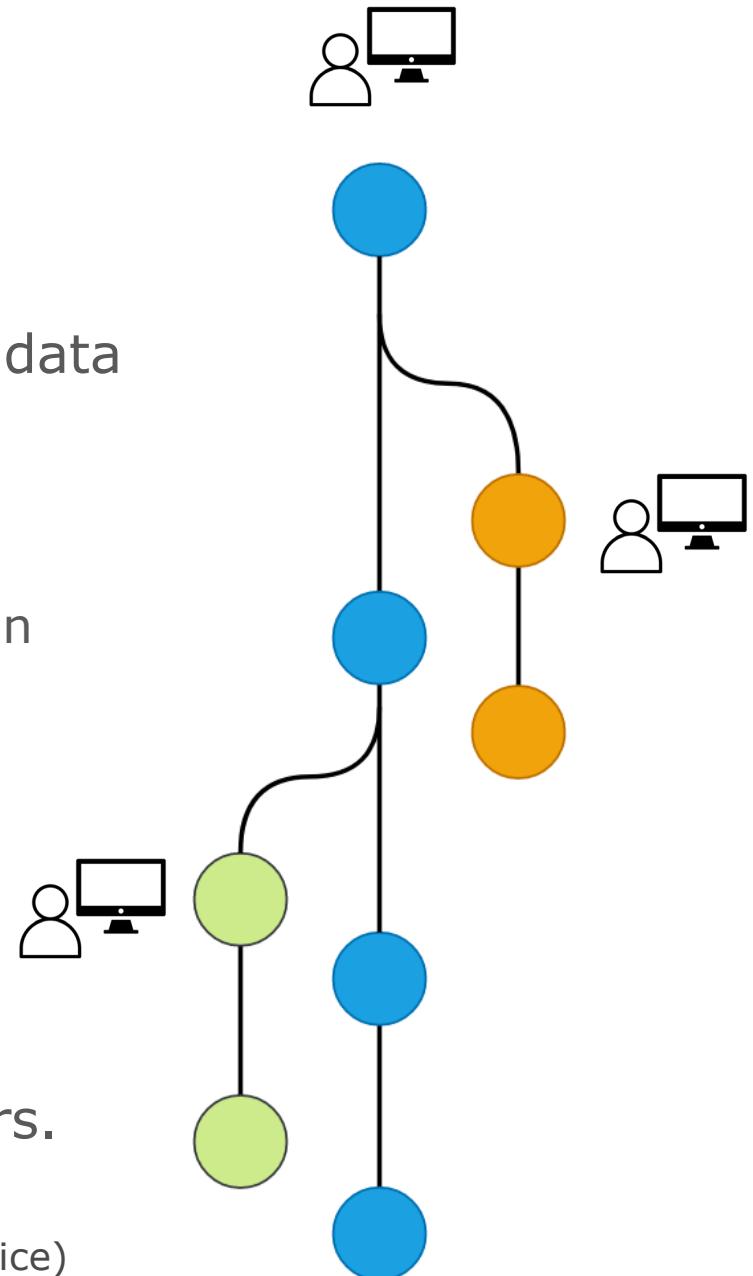
Git = Version Control System

- Manage changes to plain text files (code documents) in an ordered way.
- Commit changes to a repository.
- Branching model.

GitHub = Remote repository

- Files are pushed up to a remote/cloud repository.

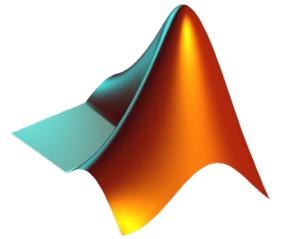
A modern research workflow used by many researchers.



Further reading: [Version control strategy and best practice](#) (UK Data Service)

Data Provenance

- Always keep a copy of the raw data untouched
- Have a separate copy which is your tidy dataset
- Keep a record of your 'recipe' (exact steps taken) to get from raw to tidy data
- Keep contextual information in a README



Tidy Data

1. Every column is a variable.

country	year	cases	population
Afghanistan	1999	745	19987071
Afghanistan	2000	2666	20595360
Brazil	1999	37737	172006362
Brazil	2000	80488	174504898
China	1999	212258	1272915272
China	2000	213766	1280428583

2. Every row is an observation.

country	year	cases	population
Afghanistan	1999	745	19987071
Afghanistan	2000	2666	20595360
Brazil	1999	37737	172006362
Brazil	2000	80488	174504898
China	1999	212258	1272915272
China	2000	213766	1280428583

3. Every cell is a single value.

country	year	cases	population
Afghanistan	1999	745	19987071
Afghanistan	2000	2666	20595360
Brazil	1999	37737	172006362
Brazil	2000	80488	174504898
China	1999	212258	1272915272
China	2000	213766	1280428583

- 1st row variable names (no spaces, simple).
- 1 sheet/table per file.
- Save in a 'plain text' format (.csv).
- Use a README.txt for background and context.

country	year	cases	population
Afghanistan	1999	745	19987071
Afghanistan	2000	2666	20595360
Brazil	1999	37737	172006362
Brazil	2000	80488	174504898
China	1999	212258	1272915272
China	2000	213766	1280428583

Identify resources for RDM

Researchers are responsible for **identifying resources** required for the management of research data, including storage, compute, unique or special infrastructure or governance requirements.

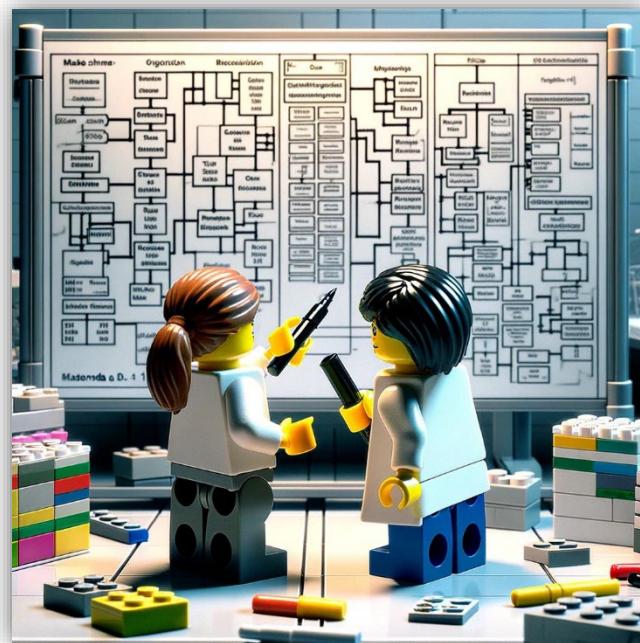
- Large or non-standard storage?
- Additional computer power? (access to GPUs, virtual machines, high performance computing [HPC], machine learning)
- Special infrastructure requirement? (software, hardware, technical expertise)
- Governance? (access committee, advisory groups)

Documentation and metadata

Ensuring research data is accompanied by appropriate **documentation** and **metadata** will help you and your collaborators to understand what you did and why. This supports the **reproducibility** of findings and is **good research practice**.

Documentation:

- README
- Data Dictionary
- Codebook
- Metadata



Metadata enables:

- Collaboration
- Governance, including data sovereignty
- Impact
- Application of data principles

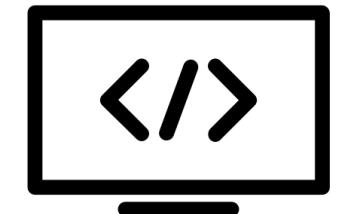
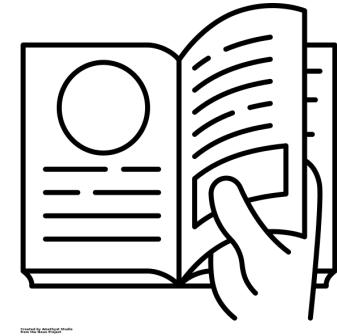
Data about the data - metadata

Library Filter :		Text	Attribute	Metadata	None	No Filter
Date	17256	Camera		Lens		
All (177 Dates)	17256	All (17 Cameras)	17256	All (53 Lenses)	17256	All (8 File Types)
► 2019	17256	Canon EOS R	212	0.0 mm f/0.0	162	Digital Negative / Lossless
		COOLPIX P1000	54	16.0-35.0 mm f/4.0	2	HEIC
		FC2103	14	24.0-48.0 mm f/2.8	278	JPEG
		FC2204	640	24.0-48.0 mm f/2.9	35	Photoshop Document (PSD)
		GFX 50R	2486	24.0-48.0 mm f/3.0	44	PNG
		GFX 50S	2180	24.0-48.0 mm f/3.1	19	Raw
		GFX 100	2230	24.0-48.0 mm f/3.2	20	TIFF
		ILCE-7RM4	1620	24.0-48.0 mm f/3.3	73	Video
		iPhone 11 Pro	1	24.0-48.0 mm f/3.4	45	
		iPhone 11 Pro Max	773	24.0-48.0 mm f/3.5	2	
		iPhone XS Max	619	24.0-48.0 mm f/3.6	16	
		L1D-20c	2634	24.0-48.0 mm f/3.7	4	
		NIKON Df	913	24.0-48.0 mm f/3.8	104	
		NIKON Z 6	1160	28.0 mm f/2.8	2634	
		NIKON Z 7	1655	50.0 mm f/1.8	737	
		X-T3	44	70.0-200.0 mm f/4.0	3	
		Unknown Camera	21	105.0 mm f/2.8	178	
				300.0 mm f/4.0	349	
				600.0 mm f/4.0	89	
				FE 12-24mm F4 G	411	
				FE 24-70mm F2.8 GM	1209	
				GF23mmF4 R LM WR	1401	

IMG_5457.HEIC		
f/2.2	1/17 seconds	ISO 1000
2 mm	★	iPhone 12 Pro Max
Aperture (F-number)	f/2.2	
ISO Sensitivity	ISO 1000	
Focal Length	2 mm	
Focal Length in 35 mm	30 mm	
Star Rating	★★★★★	
Flash	Flash did not fire, compulsory flash mode	
Aperture Max		
Date Taken	18-09-2022 09:05:13	
Edited Date	18-09-2022 11:30:53	
Speed	0.00 Kilometer per hour	
Altitude	40.551731 meters above sea level (+/- 0.00)	
FlashpixVersion	(null)	
Digital Zoom Ratio	0.000000	
Exposure Bias Value	0.00	
Exposure Mode	Auto Exposure	
Exposure Program	Normal program	
Exposure Time	0.058824 - (1/17 seconds)	
White Balance	Auto White Balance	

Metadata enables

- Collaboration at different levels
- Discovery (Findable)- human and machine readable
- Access and governance (CARE, MDSov)
- Understanding (Interoperation and Reuse) README.txt, electronic lab notebooks, data dictionary, code book
- Preservation (Reuse)



Documentation/README

FRUBASE_2008.xls
README_for...ASE_2008.txt

**** FRUBASE PACKAGE

VERSION 4.0. DEC 2007.

THE FRUBASE PACKAGE
ACCOMPANIES:

Jordano, P. 1995.
Angiosperm fleshy fruits
and seed dispersers: a
.....

README_for_FRUBASE_2008.
txt

Plain Text Document - 16 KB

THE FRUBASE PACKAGE ACCOMPANIES:

Jordano, P. 1995. Angiosperm fleshy fruits and seed dispersers: a comparative analysis of adaptation and constraints in plant-animal interactions. American Naturalist 145: 163-191.

It contains a copy of the main data file exactly as used for this paper, as well as other accompanying files (see below).

Taxonomic arrangement follows:

Cronquist, A. (1981). An integrated system of classification of flowering plants. Columbia University Press.

Nomenclature follows Stevens, P. F. (2001 onwards). Angiosperm Phylogeny Website. Version 8, June 2007. <http://www.mobot.org/MOBOT/research/APweb/>. This scheme follows: A.P.G. [= Angiosperm Phylogeny Group] II. 2003. An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II. Bot. J. Linnean Soc. 141: 399-436.

Plant names and names of higher taxonomic categories have been checked with: Mabberley, D.J. 1987. The plant-book. A portable dictionary of the higher plants. Cambridge University Press, Cambridge, UK.

Please, contact me if you have suggestions, find errors, inconsistencies, or any other bug in the file. As well, please let me know about your uses of this data and send manuscripts and reprints when available. I'll be happy to help you in any case, as far as I can.

Please, contact me if you have suggestions, find errors, inconsistencies, or any other bug in the file. As well, please let me know about your uses of this data and send manuscripts and reprints when available. I'll be happy to help you in any case, as far as I can.

I am periodically updating this data base since I started writing my PhD thesis more than 20 years ago. Thus, I'd like to receive suggestions for new data sources and provide updated versions to those interested.

Please, use these data files for peaceful purposes, enjoy doing science with them as I have enjoyed writing the paper quoted above, and learn as much as you can with them. They are the result of splendid work by many people working with plant-frugivore interactions and are embedded in papers reporting very interesting results, descriptions and discussions on these interactions; please read them.

***** CONTENTS *****
All files are plain ASCII text files, with the exception of SUMMARY and FRUBASE.xls.

Those with data have TABs as their field delimiters so they can be readily imported in any statistical package or spreadsheet program. The FRUBASE.txt is readily imported by any spreadsheet application. Please, contact me if you need the files formatted in other ways (e.g., my original SAS datasets, or EXCEL worksheets).

1. README.txt - This file. Including a description of the variables and a listing of the literature sources with the numeric codes.
 2. Summary.doc - A summary file (originally intended to appear as an Appendix in my 1995 paper) summarizing mean values for the main families and genera in the data base. This is a Microsoft WORD (version 6.0) file, which can be read directly either by the Mac or Windows versions of the program.
 3. REFS.txt - A long list with the source reference used for each species in the data file. The file is TAB delimited and has a header line with variable names: FAMILY, GENUS, SPECIES, NEWREF, and REFERENCE (authors and year).
 4. FRUBASE.txt - The data file itself. Missing data are indicated by dots (.). The file is TAB delimited and has a header line with variable names as in the list below. The file is sorted by FAMILY, GENUS, and SPECIES names, in ascending order.
 5. FRUBASE.xls - The data file itself, now in Excel format for spreadsheets. See (4).
- *****

Variable names and descriptions in FRUBASE

CL	Class
SCL	SubClass
ORD	Order
FAM	Family
GEN	Genus
SP	Species
REF	Reference number - This is my maintenance code for updates.
NEWREF	New Reference number - These are the refs numbers in the files REFS and SUMMARY.
FAMLAB	Family Label - An 8-character label for family.
GENLAB	Genus Label - An 8-character label for genus.
SPLAB	Species Label - An 8-character label for species.
COD	Species code - A 5-character code for the species.
DISPCAT	Disperser type category - BIRDS, MIXED, MAMMALS.
DISP	Disperser type - Finer categorization. Not yet completed. Needs revision.

Metadata standards

Standard, structured and formalised fields of metadata that enable people and machines to share and comprehend (reproduce) datasets.
Eg.Clinical trials, EML, CellML

- Clinical trials registry (*pictured, right*)
- [Research Data Alliance \(UK\)](#)
- [FAIR sharing](#)
- [Digital Curation Centre \(UK\)](#)

The screenshot shows a trial review page from the ANZCTR. At the top, there is a navigation bar with links for 'CREATE ACCOUNT' and 'LOGIN'. Below the navigation is a teal header bar with the text 'Trial Review'. A message in the header states: 'Technical difficulties have been reported by some users of the search function and is being investigated by technical staff. Thank you for your patience and apologies for any inconvenience caused.' Below the header, there are two blue buttons: 'VIEW TRIAL AT REGISTRATION' and 'VIEW HISTORY'. A note below these buttons says: 'The safety and scientific validity of this study is the responsibility of the study sponsor and investigators. Listing a study does not mean it has been endorsed by the ANZCTR. Before participating in a study, talk to your health care provider and refer to this [information for consumers](#)'. A green button labeled '< BACK' is located above a blue bar that says 'Trial registered on ANZCTR'. The main content area contains several sections with trial details:

Registration number	ACTRN12614000297628
Ethics application status	Approved
Date submitted	6/03/2014
Date registered	20/03/2014
Date last updated	1/07/2015
Type of registration	Prospectively registered

Titles & IDs

Public title	Treatment Approaches for Children and Young people in Child and Adolescent Mental Health Services (CAMHS) Study: Comparing the Modular Approach to Therapy for Children (MATCH-ADTC) with usual care in improving clinical outcomes of children and adolescents with depression, anxiety, trauma or conduct problems
Scientific title	In children and adolescents (aged 7-14) attending Child and Adolescent Mental Health Services (CAMHS) for depression, anxiety, trauma or conduct problems does the Modular Approach to Therapy for Children (MATCH-ADTC), compared to usual care, improve clinical outcomes (measured by comparing difference in trajectory of change of clinical severity)?
Secondary ID [1]	Nil known
Universal Trial Number (UTN)	U1111-1154-1934
Trial acronym	The TRACY study
Linked study record	

Health condition

Health condition(s) or problem(s) studied:	
Depression	
Anxiety	
Trauma symptoms	
Conduct problems	

Condition category	Condition code
Mental Health	Depression
Mental Health	Anxiety
Mental Health	Other mental health disorders

Storage, Sharing and Access

Store data so that they are protected against corruption and loss. Research data should be prepared for preservation or archive to substantiate research findings.

- Data storage
- Research data vs. research debris
- Preservation and archive
- Retention and deletion

Digital research data storage

Researchers should ensure that digital forms of research data are stored so that they are **protected against corruption and loss, secured** appropriately and **findable** by those who need to exert long-term governance or stewardship.

Project specific

People/access
Legal, ethics etc. conditions
Files, incl. README & DMP
Security classification
Governance
Retention period

Storage considerations and approach

- What data are being collected/gathered?
- Are you working with confidential or sensitive data?
- Where are you required to, or have agreed to, store data?
- Who needs access, and where are they when they access?
- Does the project need granular access restrictions?
- What processing or analysis will be needed?
- What is available?

Backing up your research data

What is your backup routine?

- What data/files need to be backed up?
How often? Where? By whom?
- Regularly check if data is not corrupted.
- At least 2 people should have access to the data.

Follow the 3-2-1 rule



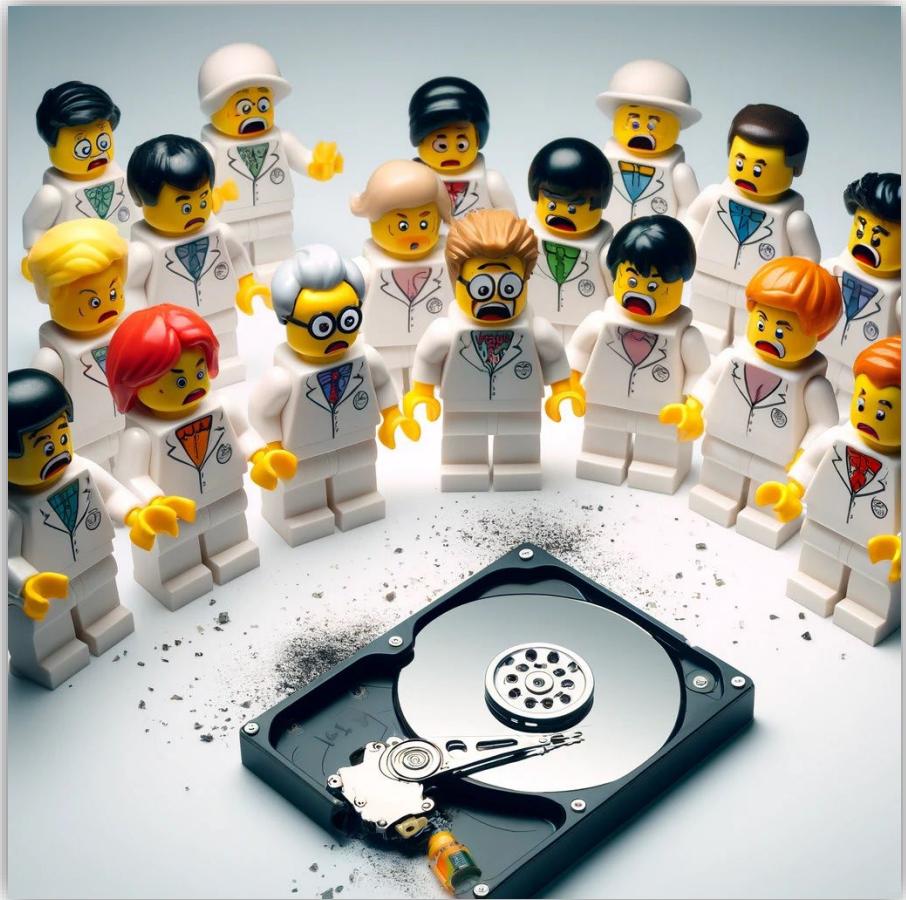
At least **3** copies



Using at least **2** different storage media



At least **1** copy offsite



NB. Network drives are backed up on tape every night in multiple physical locations.



7. Data storage

Research data storage options

Personal devices are usually not appropriate



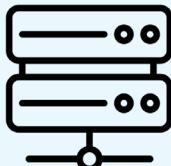
Data capture

Self-service
or managed



Storage

Network storage



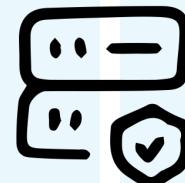
Dropbox (cloud storage)



MS OneDrive
(personal), Teams,
SharePoint (online)



Secure Research
Environment



Analysis &
visualisation with
research compute -
virtual machines
and HPC

Sustainable use of storage



Data storage is **expensive** and has **environmental** costs to consider.

Tips to take control of your storage space:

1. Regularly review your files
2. Understand and identify **research data vs. research debris**
3. Enable future use e.g., open formats
4. Use different storage tiers/products – slower=cheaper

88% of organizations surveyed have no idea of the content in their stored data.

58% of organizations are keeping information indefinitely.

79% of organizations say too much time and effort is spent manually searching and disposing information that has met its retention requirements.

58% of organizations still rely on employees to decide how to apply corporate policies.

Source: The Information Explosion survey from the Council for Information Auto-Classification
<http://infoautoclassification.org/>

Preservation and Archive

Preserving or **archiving** data ensures that it lives beyond the end of a specific research project.

- What data must be retained (& destroyed?) and/or preserved?
- Archive vs. preservation (passive vs. active)
- Publishing as archive.
- What are you trying to achieve or enable?
- Where have you left your data? How long for?
- Who is responsible, who is the data steward?
- Will the future be able to open and make sense of it?



<https://library.si.edu/research/best-practices-storing-archiving-and-preserving-data>

Return, retention, deletion, & destruction

Researchers should ensure that research data are **returned, retained, deleted** and/or **destroyed** in accordance with legal, ethical, data sovereignty and commercial constraints.

- Is there a requirement to return research data?
- What is the minimum retention period? During this period, the data will be:
 - **Published?** Assigned DOI, licensed for re-use, access controls – if required.
 - **Archived?** Confidential and non-digital data held locally.
- Deletion of archived digital research data ✓
- Destruction of digital research data files stored on University-managed storage is not achievable in most cases. ✗



8. Retention

Publish and Report

Wherever possible, data should be shared (published) so that it can be consulted and re-used by other researchers.

- Dissemination & copyright (rightsholders)
- Publish data & metadata
 - FAIR & CARE
 - Licenses
- Data availability

Dissemination

Research findings are usually shared with multiple audiences:

- Thesis submission
 - Manuscript preparation
 - Community dissemination
-
- Who makes decisions about what is disseminated?
 - Is the sharing of **research data** a condition of publication?



ORIGINAL ARTICLE
Endocrine Care

Exercise Training in Pregnancy Reduces Offspring Size without Changes in Maternal Insulin Sensitivity

Sarah A. Hopkins, James C. Baldi, Wayne S. Cutfield, Lesley McCowan, and Paul L. Hofman

Liggins Institute (S.A.H., W.S.C., P.L.H.), The University of Auckland, Auckland 1142, New Zealand; Northern Arizona University (J.C.B.), Flagstaff, Arizona 86011; and Department of Obstetrics and Gynaecology (L.M.), The University of Auckland, Auckland 1142, New Zealand

Context: Epidemiological studies have identified the importance of the *in utero* environment in providing a healthy start to life. Previous studies have suggested that the maternal environment, in particular a reduction in maternal insulin sensitivity, contributes significantly to fetal growth. Regular aerobic exercise, through an effect on maternal insulin sensitivity, may influence offspring size by regulating nutrient supply to the fetus.

Objective: The aim of the study was to determine the effects of aerobic exercise training in the second half of pregnancy on maternal insulin sensitivity and neonatal outcomes.

Design and Setting: We conducted a community-based, randomized, controlled trial of exercise in pregnancy.

Participants: Eighty-four healthy nulliparous women (mean \pm SD, age, 30 ± 4 yr; body mass index, 25.5 ± 3.0 kg/m 2) participated in the study.

Interventions: Participants were randomly assigned to either a control group ($n = 42$) who participated in a home-based stationary cycling program from 20 wk gestation or an exercise group ($n = 42$) who participated in a home-based stationary cycling program from 20 wk gestation.

Measurements and Main Findings: Maternal insulin sensitivity, neonatal auxology, body composition, and umbilical cord serum were measured.

Conclusion: Exercise training in late pregnancy was associated with lower birth weights and reduced cord serum insulin-like growth factor-I and insulin-like growth factor-binding protein-3 concentrations, suggesting an influence of exercise on endocrine regulation of fetal growth. These effects on offspring growth were not associated with an exercise training effect on maternal insulin sensitivity. *J Clin Endocrinol Metab* 95: 2080–2088, 2010

Epidemiological studies have identified the importance of the *in utero* environment in providing a trajectory for health in later life. To date, studies examining the effects of maternal exercise on fetal growth have focused primarily on offspring birth size, with inconsistent findings (1–6). A recent systematic review (7) has summarized the small number of randomized controlled trials and highlighted their limitations, including small sample sizes and inadequate quantification of exercise performance and compliance. The majority of these studies have used high-impact weight-bearing programs that may not be achievable for all pregnant women. Non-weight-bearing activities, such as cycling or

Alternatives: AIR, Acute insulin response; BMI, body mass index; DI, deposition index; DNA, deoxyribonucleic acid; IGF, IGF-binding protein; SGA, small for gestational age; S, results smoothed mean.

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doi:10.1210/jen.2009-2255 Received October 23, 2009; Accepted February 5, 2010.
First Published Online March 24, 2010

2080 jom.endojournals.org J Clin Endocrinol Metab, May 2010, 195(5):2080–2088

Who holds the copyright?

- Copyright holder can license a work
- Choose open licences
- Check rights and permissions if re-using data
- Start ownership discussions early
- Explicit copyright display
- “As open as possible, as closed as necessary”



<https://research-hub.auckland.ac.nz/article/copyright-advisory>

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Document
Copyright Materials Policy

As both a producer and consumer of

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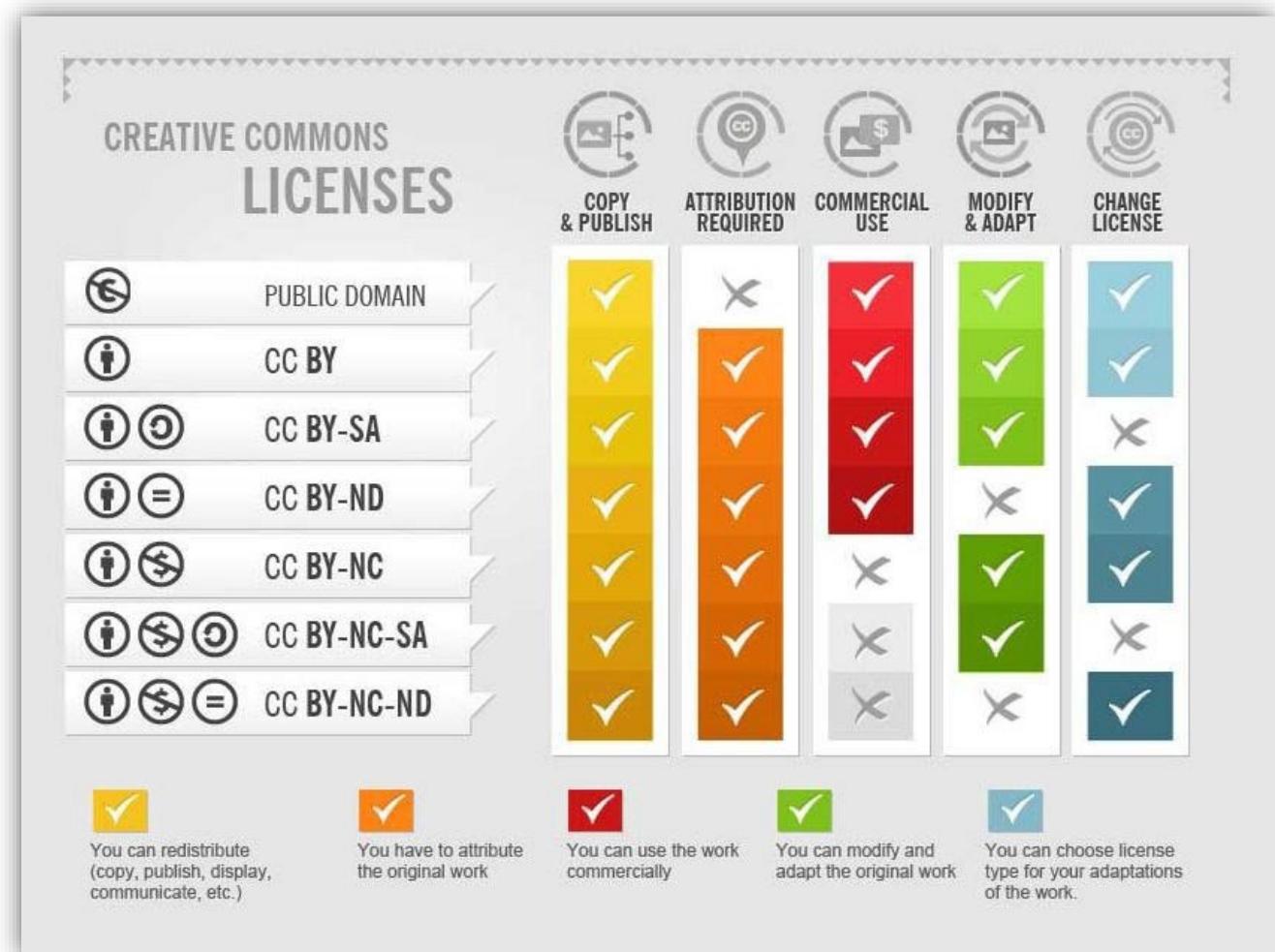
Article

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Publish data

Researchers are strongly encouraged to **publish digital forms of research data** in a suitable research data repository unless the data cannot be published due to legal, ethical, data sovereignty or commercial constraints.

Include, where possible, a **data availability statement** in all accepted manuscripts and final accepted theses describing how and on what terms any supporting research data may be accessed.

- How do you know whether you can, or should, publish data?

F

A

I

R

Findable

Accessible

(others know how to
access)

Interoperable

Reusable

Metadata (descriptive information),
DOI and process for access are
external facing, human and
machine readable E.g., internet
search results, bibliographic
databases.

Metadata is with data and
disciplinarily specific. Combining
and using data are enabled by
format and file type(s).
E.g., Data Management Plan,
Protocol, README.txt

FAIR principles

Findable Accessible Interoperable Reusable

Exemplar

Australian Antarctic Data Centre
Data management and spatial data services

Menu Search Search Login Support

Australian Antarctic Data Centre / Discover and Manage Data / Records / chlorophyll_65-02

Metadata details

chlorophyll_65-02

[View the full metadata record](#)

Citation
Hirawake, T. (2005) Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean during 1965-2002, Ver. 1, Australian Antarctic Data Centre - doi:[10.4225/15/5a384270f2b61](https://doi.org/10.4225/15/5a384270f2b61), Accessed: 2024-04-19

Title
Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean during 1965-2002

Data Centre
[Australian Antarctic Data Centre, Australia](#)

DOI
[doi:10.4225/15/5a384270f2b61](https://doi.org/10.4225/15/5a384270f2b61)

Created Date
2005-08-22

Revision Date
2017-12-18

Parent record
None

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Datasets and documents

chlorophyll_65-02
Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean ...
[Download dataset](#) [View dataset contents](#)
Public Submitted 22 Aug 2005

chlorophyll_65-02
Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean ...
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Released - AAD Only Submitted 22 Aug 2005

Related links

[Download point for the data - Excel spreadsheet](#)
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The variation in the phytoplankton biomass over a decadal time scale, and its relationship with the Antarctic Circumpolar Wave (ACW) and climate change, has been poorly interpreted because of the limited satellite chlorophylla (chl a) data compared with the physical parameters from satellite. We analysed a long-term chl a dataset along the Japanese Antarctic Research Expedition (JARE) cruise tracks since 1965 to investigate inter-annual variation of phytoplankton biomass. In the Southern Ocean, increasing trends of chl a and the spreading of higher chl a area to the north with 3-7 year cycles were found. Although relationships between the decadal change in chl a and climate change such as variation of sea ice extent and the El Nino

Access

These data are publicly available for download from the provided URL. A copy of some of the referenced publications is available for download by AAD staff only.

Temporal Coverages

- Start date: 1965-11-23 - Stop date: 2002-12-08

Spatial Coverages



Latitude	Longitude
Northernmost:	Westernmost:
24.567	100.147
Southernmost:	Easternmost:
-54.985	137.95

Science Keywords

- EARTH SCIENCE > CLIMATE INDICATORS > ATMOSPHERIC/OCEAN INDICATORS > TELECONNECTIONS > ANTARCTIC OSCILLATION
- EARTH SCIENCE > CLIMATE INDICATORS > ATMOSPHERIC/OCEAN INDICATORS > TELECONNECTIONS > EL NINO SOUTHERN OSCILLATION (ENSO)
- EARTH SCIENCE > BIOSPHERE > ECOSYSTEMS > AQUATIC ECOSYSTEMS > PLANKTON
- EARTH SCIENCE > OCEANS > OCEAN CHEMISTRY > PIGMENTS > CHLOROPHYLL
- EARTH SCIENCE > BIOSPHERE > ECOLOGICAL DYNAMICS > ECOSYSTEM FUNCTIONS > BIOMASS DYNAMICS

Additional Keywords

- CHLOROPHYLL A
- JARE
- PHYTOPLANKTON
- SOUTHERN OCEAN

Locations

- OCEAN > INDIAN OCEAN
- OCEAN > SOUTHERN OCEAN
- OCEAN > PACIFIC OCEAN
- GEOGRAPHIC REGION > POLAR

Platforms

Instruments

Researchers

Use Constraints

This data set conforms to the CC BY Attribution License (<http://creativecommons.org/licenses/by/4.0/>).

Please follow instructions listed in the citation reference provided at http://data.aad.gov.au/aadc/metadata/citation.cfm?entry_id=chlorophyll_65-02 when using these data.

Project

ISO Topic

- BIOTA
- CLIMATOLOGY/METEOROLOGY /ATMOSPHERE
- OCEANS

Dataset Language

- ENGLISH

Originating Centre

- JARE

Dataset Progress

- COMPLETE

IDN Node

- AMD/AU
- CEOS
- AMD

Publications

- Fukuchi, M. (1980) Phytoplankton chlorophyll stocks in the Antarctic Ocean, *J. Oceanogr. Soc. Jpn.*, 36, 73-84
- Fukuchi, M., and S. Tamura (1982) Chlorophyll a distribution in the Indian sector of the Antarctic Ocean in 1978-1979, *Antarct. Rec.*, 74, 143-162
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- Hamada, E., A. Taniguchi, M. Okazaki, and Y. Naito (1985) Report on the phytoplankton pigments measured during the JARE-25 Cruise to Syowa Station, Antarctica, November 1983 to April 1984, *ARE Data Rep.*, 89, Natl. Inst. Polar Res., Tokyo, 103
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- Hirawake, T., and M. Fukuchi (2004) Chlorophyll a concentration of phytoplankton during the cruises of 40-44th Japanese Antarctic Research Expedition in 1998-2003, *JARE Data Rep.*, 31, Natl. Inst. Polar Res., Tokyo, 279
- Ino, Y., and M. Fukuchi (1984) Report on chlorophyll a distribution along the course of the Fuji in 1981-1982, *Antarct. Rec.*, 81, 38-44
- Kanda, H., and M. Fukuchi (1979) Surface chlorophyll a concentration along the course of the Fuji to and from Antarctica in 1977-1978, *Antarct. Rec.*, 66, 37-49
- Midorikawa, T., K. Nomura, Y. Miyamoto, T. Odate, A. Ishikawa, N. Washiyama, T. Hirawake, M. Namiki (2000) Report on phytoplankton pigments measured during the JARE-36~39 cruises to Syowa Station, Antarctica in 1994-1998, *JARE Data Rep.*, 249, 36, Natl. Inst. Polar Res., Tokyo
- Sasaki, H. (1984) Distribution of nano- and microplankton in the Indian sector of the Southern Ocean, *Mem. Natl. Inst. Polar Res. Spec. Issue*, 32, 38-50
- Suzuki, T., and M. Fukuchi (1997) Chlorophyll a concentration measured with a continuous water monitoring system during the cruise to Syowa Station, Antarctica, JARE-27 (1985/86) to JARE-35 (1993/94), 60, Natl. Inst. Polar Res., Tokyo
- Tanimura, A. (1981) Distribution of the surface chlorophyll a along the course of the Fuji to and from Antarctica in 1979-1980, *Antarct. Rec.*, 72, 35-48
- Watanabe, K., and Y. Nakajima (1983) Surface distribution of chlorophyll a along the course of the Fuji (1980/81) in the Southern Ocean, *Antarct. Rec.*, 77, 33-43

Metadata Revision History

2010-07-27 - record updated by Dave Connell to change URL Content Type. 2017-12-18 - record updated by Dave Connell - basic updates.





Dataset

chlorophyll_65-02

Metadata Entry ID: chlorophyll_65-02

Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean during 1965-2002

[View Metadata Record](#)[Download Dataset](#)

Contents

Resource	Type	Last Modified	File Size
 LICENSE	File	2022-08-19	250 B
 README	File	2022-08-19	3.31 KB
 chlorophyll_65-02.csv	File	2022-08-19	51.67 KB
 chlorophyll_65-02.xml	File	2022-08-19	16.25 KB

4 records

Citation

Hirawake, T. (2005) Long-term variation of surface phytoplankton chlorophyll a in the Southern Ocean during 1965-2002, Ver. 1, Australian Antarctic Data Centre - doi:10.4225/15/5a384270f2b61, Accessed: 2024-04-19

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F

Findable

A

Accessible



Everyone

C

Collective benefit

A

Authority to control their data

R

Responsibility to engage
respectfully with those communities

E

Indigenous Peoples' **ethics** should
inform the use of data across time

I

Interoperable

R

Reusable



Specific people
and purpose

Balancing FAIR and CARE (or other constraint to publishing data)

Practical steps:

1. Publish a **descriptive or metadata-only record**
2. Create a **mediated access process**
3. Use a **data sharing agreement**
4. Produce a **data availability statement** linking data DOI to research outputs



 Carroll, S.R., Herczog, E., Hudson, M. et al. Operationalizing the CARE and FAIR Principles for Indigenous data futures. *Sci Data* **8**, 108 (2021). <https://doi.org/10.1038/s41597-021-00892-0>



9. Data or metadata-only publishing

Data availability statements

Data Availability Statement: All data generated or analyzed during this study are included in this paper and its [Supporting Information](#) files, except the sound .wav files, which are available through Figshare (https://auckland.figshare.com/articles/media/Sound_wav_files_use/20103734; DOI: 10.17608/k6.auckland.20103734).

PLOS ONE

RESEARCH ARTICLE

Direct liquid transmission of sound has little impact on fermentation performance in *Saccharomyces cerevisiae*

Rachel Benítez^{1*}, Alastair Harris¹, Evie Mansfield¹, Pat Silcock², Graham Eyres², Silas G. Villas-Boas³, Andrew Jeffs¹, Austen R. D. Ganley¹*

¹ School of Biological Sciences, University of Auckland, Auckland CBD, New Zealand, New Zealand,

² Department of Food Science, University of Otago, Dunedin, New Zealand, ³ Luxembourg Institute of Science and Technology, Z.A.E. Robert Steichen, Luxembourg, Luxembourg

* These authors contributed equally to this work.
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OPEN ACCESS

Citation: Benítez R, Harris A, Mansfield E, Silcock P, Eyres G, Villas-Boas SG, et al. (2023) Direct liquid transmission of sound has little impact on fermentation performance in *Saccharomyces cerevisiae*. PLOS ONE 18(2): e0281762. <https://doi.org/10.1371/journal.pone.0281762>

Editor: Shashi Kant Bhata, Konkuk University, REPUBLIC OF KOREA

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Peer Review History: PLOS recognizes the benefits of transparency in the peer review process; therefore, we enable the publication of all of the content of peer review and author responses alongside final published articles. The editorial history of this article is available here: <https://doi.org/10.1371/journal.pone.0281762>

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Data Availability Statement: All data generated or analyzed during this study are included in this paper and its [Supporting Information](#) files, except the sound .wav files, which are available through

Abstract

Sound is a physical stimulus that has the potential to affect various growth parameters of microorganisms. However, the effects of audible sound on microbes reported in the literature are inconsistent. Most published studies involve transmitting sound from external speakers through air toward liquid cultures of the microorganisms. However, the density differential between air and liquid culture could greatly alter the sound characteristics to which the microorganisms are exposed. In this study we apply white noise sound in a highly controlled experimental system that we previously established for transmitting sound underwater directly into liquid cultures to examine the effects of two key sound parameters, frequency and intensity, on the fermentation performance of a commercial *Saccharomyces cerevisiae* ale yeast growing in a maltose minimal medium. We performed these experiments in an anechoic chamber to minimise extraneous sound, and find little consistent effect of either sound frequency or intensity on the growth rate, maltose consumption, or ethanol production of this yeast strain. These results, while in contrast to those reported in most published studies, are consistent with our previous study showing that direct underwater exposure to white noise sound has little impact on *S. cerevisiae* volatile production and sugar utilization in beer medium. Thus, our results suggest the possibility that reported microorganism responses to sound may be an artefact associated with applying sound to cultures externally via transmission through air.

Introduction

The effects of environmental stimuli, such as temperature, oxygen and nutrient availability, on microbial growth and behaviour are well known and are carefully managed in commercial applications [1–3]. In contrast, sound as an environmental stimulus has received less research attention and receives scant attention in commercial applications. Published results indicate that audible sound (20 Hz–20 kHz) [4] stimulation can directly affect growth and other

Data repositories

- Designed to store, preserve, and provide access to research data (enables FAIR) or a metadata record (balance of FAIR/CARE)
- Multidisciplinary or discipline specific options



figshare



- Items are assigned a permanent, resolvable and citable Digital Object Identifier (DOI)
- Track views, downloads, citations for impact.

A screenshot of a website for "Discover research from The University of Auckland". The header features the university's logo and navigation links for "ALL", "CATEGORIES", "GROUPS", and "SEARCH". Below the header, there are sections for "Dataset" items and "Report" items. Each item has a thumbnail, title, description, and posting details. A sidebar on the right shows a "Table of Contents" for a Google Site and a "ACODE 88 Pre-workshop survey results" dataset.

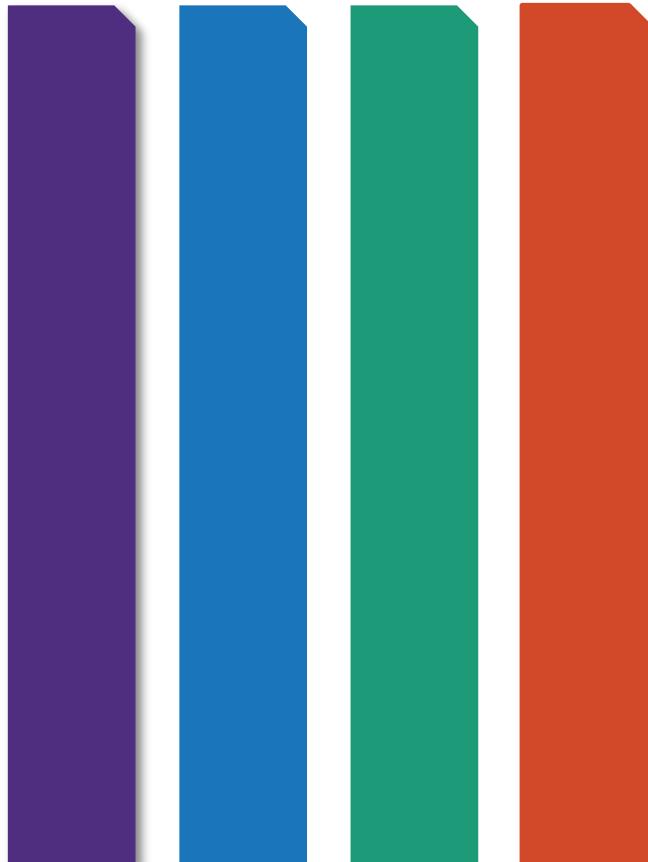
Dataset Title	Report Title	Author(s)	Posted On
Fetal brain cortical tissue GRN	Food rescue in 2022: Where to from here?	Catriona Miller	2023-04-06
Adult brain cortex GRN	Food waste series - Report 2: Food rescue in 2022: Where to fr...	Catriona Miller	2023-04-06
Working together for Inclusive Education: Interprofessional ...	Data and Code for "The effect of temperature on the ...	Bianca Jackson	2023-04-05
Table of Contents: Gavin Brown's Google Site	ACODE 88 Pre-workshop survey results	Gavin T. L. Brown	2023-03-31
On Translation: Some advice	Centre for eResearch 2022	Gavin T. L. Brown	2023-03-28
Food waste series - Report 2: Food rescue in 2022: Where to fr...	Media	Juliet Gerrard	2023-03-23
Data and Code for "The effect of temperature on the ...		Jonathan Simpson	2023-03-23
ACODE 88 Pre-workshop survey results		Steve Leichtweis	



[Data Repository Platforms](#)

Discovery & Reuse (by others)

Data that are available for discovery and access may be reused, either to substantiate findings or to generate new insights.



- Governance
 - Long term stewardship
 - Data access committees
- Impact
- Future collaboration

Re-use of data

Data that are made available for discovery and access may be reused by other researchers, either to substantiate or reproduce original findings or to generate new insights.

Where appropriate, infrastructures have been developed to review proposed uses of data prior to data being released. One example is **Data Access Groups / Data Access Committees**.

Governance helps to:

- Ensure compliance with original ethics restrictions
- Prevent damage to the original researcher's IP
- Prevent harm to study participants (e.g., reidentification)

When researchers leave...

Ensure appropriate arrangements are made if researchers require AND have rights to continued access to research data after leaving the project or moving to another research organisation/institution.

Handover of research data management, including:

- Updating the Data Management Plan (DMP)
- Off-boarding meetings to discuss arrangements for ensuring ongoing access
- Update all agreements and ethics approvals

May also include:

- Data Transfer Agreement to transfer the research data to another institution (where permitted by ethics approvals and agreements),
- Establishing external collaborator status for the departing staff member or student where ongoing access to research data held at the University is required and permitted.

What happens when a PhD candidate hands in their thesis?

- Students generally retain 'ownership' of data created for postgraduate thesis submission.
- Ethics restrictions regarding where, and for how long, sensitive data is retained still apply.



**10. What haven't we discussed?
(Add your questions into the chat
or raise your hand)**





UNIVERSITY OF
AUCKLAND
Waipapa Taumata Rau
NEW ZEALAND

Questions? Get in touch...



researchdata@auckland.ac.nz

*Research data are a treasure.
Managing data is about caring for data
to reflect this.*

Thank you