



Ottawa Hospital Research Institute

Research Data Management Strategy

Inspired by research. **Inspiré** par la recherche.
Driven by compassion. **Guidé** par la compassion.

A. Background & Context

The purpose of the Ottawa Hospital Research Institute (OHRI) Institutional Research Data Management (RDM) Strategy is to support a research culture that fosters research excellence, open science, and responsible stewardship of public research funding. This is in alignment with federal and international funding mandates concerning data sharing. Research data should be made as open as possible and closed only as necessary to facilitate access and reuse. This philosophy requires a commitment to the inclusive use of data management practices to ensure Canadian researchers are well-positioned to contribute to and capitalize on data-intensive science and scholarship¹.

In March 2021, Canada's three federal research funding agencies—the Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council (NSERC), and the Social Sciences and Humanities Research Council (SSHRC)—launched the Tri-Agency Research Data Management Policy (RDM Policy). The agencies developed the Tri-Agency Research Data Management Policy to support Canadian research excellence by fostering sound digital data management and data stewardship practices. The Tri-Agency RDM policy requires that all institutions eligible to administer CIHR, NSERC or SSHRC funds create an institutional RDM strategy. This RDM strategy complies with that requirement.

In the Fall of 2021, the OHRI Senior Management Team convened the Research Data Management & Sharing (RDM&S) Advisory Committee to develop an institutional RDM Strategy. The RDM&S Advisory Committee comprises representatives from OHRI, The Ottawa Hospital (TOH), the Eastern Ontario Regional Laboratory Association (EORLA), and one patient-partner. OHRI is represented by individuals from:

- Each of OHRI's five research programs (Cancer Therapeutics, Chronic Disease, Clinical Epidemiology, Neuroscience, Regenerative Medicine)
- Business Systems Integration Team (BSIT)
- Contracts
- Tech Transfer Office
- Core research services - specifically, the Ottawa Methods Centre (OMC), High Content Imaging, StemCore Laboratories, Proteomics, and Bioinformatics.

The TOH representatives are from TOH Analytics and the TOH Privacy Office.

The Chair and Co-Chair of the RDM&S Advisory Committee drafted the institutional RDM strategy for the committee's review and revisions. From there, it received input from the RDM&S Advisory Committee at large and OHRI's broader research community before receiving final approval from the OHRI Senior Management Team

OHRI Commitment

OHRI is committed to supporting its researchers in adopting responsible RDM practices consistent with ethical, legal, and commercial obligations and Tri-Agency requirements. Additionally, OHRI acknowledges that Indigenous peoples have the right to control the collection, ownership, and application of Indigenous data and encourages the use of data management

¹ Government of Canada. (2022). Research Data Management. Retrieved from Tri-Agency Policies and Guidelines: https://www.ic.gc.ca/eic/site/063.nsf/eng/h_547652FB.html

practices that incorporate the First Nations Principles of OCAP® and respect Indigenous data sovereignty via the CARE Principles for Indigenous Data Governance. There is currently no guidance on the ethics of research data for Metis and Inuit. To take further steps in promoting culturally safe and responsible research with all Indigenous peoples, OHRI will explore how incorporating the Six Principles of Métis Health Research and the Inuit Qaujimajatuqangit (IQ), traditional Inuit laws and principles that guide a way of life and knowing, will influence RDM practices at the institution. OHRI supports the notion that researchers and scholars should be working with Indigenous peoples to co-develop research rather than merely conducting research on Indigenous populations.

This document will be used by OHRI decision-makers (including OHRI administration) and staff with RDM-related job responsibilities when developing and reviewing OHRI research support services and policies. The Strategy's objectives will be reviewed, assessed, and updated by the RDM&S Advisory Committee every three years. Indicators of success will be developed to measure progress and may include usage statistics, research demand and satisfaction, and more. The RDM&S Advisory Committee will engage the services of the appropriate OHRI scientists or staff members to assist with developing an assessment plan.

B. Definitions

Abbreviations and definitions of terms used in this Strategy are listed in alphabetical order below.

CARE Principles - CARE Principles for Indigenous Data Governance stands for Collective Benefit, Authority to Control, Responsibility, and Ethics. The Principles were developed by The International Indigenous Data Sovereignty Interest Group (within the Research Data Alliance), a network of nation-state-based Indigenous data sovereignty networks and individuals, in consultation with Indigenous Peoples, scholars, non-profit organizations, and governments. The CARE Principles are people- and purpose-oriented, reflecting the crucial role of data in advancing innovation, governance, and self-determination among Indigenous Peoples. The Principles complement the existing data-centric approach represented in the FAIR Guiding Principles for scientific data management and stewardship²

Data sharing - the method of making data used for research freely available to others through a variety of mechanisms that reinforce transparent reporting, support open scientific inquiry, and encourage re-evaluation which can lead to novel insights otherwise not described by the original researchers³

Data management plan (DMP) - a data management plan (DMP) is a written document that describes the data expected to be acquired or generated during the course of a research project, how it will be managed, described, analyzed, and stored, and what mechanisms will be used at the end of the project to share and preserve the data⁴

² Carroll, S.R., Garba, I., Figueroa-Rodríguez, O.L., Holbrook, J., Lovett, R., Materechera, S., Parsons, M., Raseroka, K., Rodriguez-Lonebear, D., Rowe, R., Sara, R., Walker, J.D., Anderson, J. and Hudson, M., 2020. The CARE Principles for Indigenous Data Governance. *Data Science Journal*, 19(1), p.43. DOI: <http://doi.org/10.5334/dsj-2020-043>

³ OHRI Centre for Journalology. (2022). *Data sharing*. OHRI Centre for Journalology Resources. <https://www.ohri.ca/journalology/data-and-materials-sharing>

⁴ Stanford Libraries. (2022). *Data Management Plans*. Stanford Libraries Data Management Services: <https://library.stanford.edu/research/data-management-services/data-management-plans>

FAIR Principles – the FAIR Guiding Principles for scientific data management and stewardship provide guidelines to improve the **F**indability, **A**ccessibility, **I**nteroperability, and **R**euse of digital assets. The principles emphasize machine-actionability (i.e., the capacity of computational systems to find, access, interoperate, and reuse data with none or minimal human intervention) because humans increasingly rely on computational support to deal with data because of the increase in volume, complexity, and creation speed of data⁵

First Nations Principles of OCAP - the First Nations Principles of OCAP (ownership, control, access, and possession) means that First Nations control data collection processes in their communities. First Nations own, protect and control how their information is used. Access to First Nations data is important, and First Nations determine how access to external researchers is facilitated and respected under appropriate mandates and protocols⁶. The below definitions were derived verbatim from the First Nations Information Governance Centre⁷:

- **Ownership:** Ownership refers to the relationship of First Nations to their cultural knowledge, data, and information. This principle states that a community or group owns information collectively in the same way that an individual owns his or her personal information.
- **Control:** The principle of control affirms that First Nations, their communities and representative bodies are within their rights in seeking to control over all aspects of research and information management processes that impact them. First Nations' control of research can include all stages of a particular research project from start to finish. The principle extends to the control of resources and review processes, the planning process, management of the information and so on.
- **Access:** First Nations must have access to information and data about themselves and their communities, regardless of where it is currently held. The principle also refers to the right of First Nations communities and organizations to manage and make decisions regarding access to their collective information. This may be achieved, in practice, through standardized, formal protocols.
- **Possession:** While ownership identifies the relationship between a people and their information in principle, possession or stewardship is more concrete. It refers to the physical control of data. Possession is a mechanism by which ownership can be asserted and protected.

Inuit Qaujimagatugangit (IQ) – is the term used to describe Inuit epistemology or the Indigenous knowledge of the Inuit. The term translates directly as "that which Inuit have always known to be true." Like other Indigenous knowledge systems, Inuit Qaujimagatugangit is recognized to be a unified system of beliefs and knowledge characteristic of the Inuit culture. The term 'Inuit Qaujimagatugangit' was formally adopted by the Government of Nunavut; however, the

⁵ Wilkinson, M., Dumontier, M., Aalbersberg, I. et al. The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data* 3, 160018 (2016). <https://doi.org/10.1038/sdata.2016.18>

⁶ First Nations Information Governance Centre. (2022). *Understanding the First Nations Principles of OCAP*. FNIGC Online Library: https://fnigc.ca/wp-content/uploads/2020/09/2be8f15f2eff14b1f122b6a26023836a_fnigc_ocap_brochure_en_final_0.pdf

⁷ First Nations Information Governance Centre. (2022). *The First Nations Principles of OCAP®*. FNIGC OCAP Training: <https://fnigc.ca/ocap-training/>

descriptors used to capture the essence of Inuit Qaujimajatuqangit are recognized as being consistent with Inuit worldview as it is described in various Inuit circumpolar jurisdictions⁸

Ottawa Hospital Research Institute Senior Management Team (OHRI SMT) – the OHRI SMT provides scientific and administrative leadership for the Institute. The current SMT composition can be found here: <https://www.ohri.ca/Leadership/>

OHRI Business Systems Integration Team (OHRI BSIT) – an internal group within OHRI's administration team responsible for, among other things, digital infrastructure support, website and app design, development, and hosting, IRIS, application, and framework security evaluation and testing, and consulting support for emerging technologies and tools

Principles of Ethical Métis Research – In March of 2010, the Métis Centre hosted a Think Tank on Métis specific research ethics. It brought together several experienced Métis researchers, students, and Métis organizations to begin a dialogue about research ethics. The Métis Centre engaged this diverse group from across Canada in discussing Métis-specific, culturally competent ethical research principles. Through this discussion, the Métis Centre established a standard that the Métis Centre adheres to in its research and that other groups may choose to use to conduct research that has an impact on the lives of Métis people. These principles are intended to reflect the considerable experience of the participants involved. Outside groups may choose to use these principles in whole or adapt them to their needs as they see fit. The principles are not intended to be enforceable rules that must be followed but rather are a well-thought-out starting point to engage Métis communities in ethical research⁹

RDM&S Advisory Committee – OHRI Research Data Management & Sharing Advisory Committee

Research Data – research data refers to primary data (data collected or generated by the researcher) that are used to support technical or scientific inquiry, research, scholarship, or creative practice and used as evidence in the research process. Research data may be experimental data, observational data, operational data, third-party data, public sector data, monitoring data, processed data, or repurposed data. What is considered relevant research data is often highly contextual and determining what counts as such should be guided by disciplinary norms¹⁰

Research Data Management (RDM) – research data management refers to the processes applied through the lifecycle of a research project to guide the collection, documentation, storage, sharing and preservation of research data¹¹. RDM is essential throughout the data lifecycle—from data creation, processing, analysis, preservation, storage and access, to sharing and reuse (where appropriate), at which point the cycle begins again. Data management should be practiced over the entire lifecycle of the data, including planning the investigation, conducting the research,

⁸ National Collaborating Centre for Indigenous Health (2022). Inuit Qaujimajatuqangit: The role of Indigenous knowledge in supporting wellness in Inuit communities in Nunavut.

⁹ National Aboriginal Health Organization (NAHO). (2022). Principles of Ethical Metis Research. Retrieved from NAHO Publications and Resources: <https://fnim.sehc.com/se-learning/naho-publications-and-resources/metis-centre>

¹⁰ Government of Canada. (2022). Frequently Asked Questions. Retrieved from Tri-Agency Research Data Management Policy: https://www.science.gc.ca/eic/site/063.nsf/eng/h_97609.html#1b

¹¹ Digital Research Alliance of Canada. (2019). RDM Primer. Retrieved from RDM: https://portagenetwork.ca/wp-content/uploads/2019/08/Primer_RDM_August2019_EN.pdf

backing up data as it is created and used, disseminating data, and preserving data for the long term after the research investigation has concluded¹²

TRUST Principles – stakeholders representing various segments of the digital repository community have collaboratively developed and endorsed a set of guiding principles to demonstrate digital repository trustworthiness. **T**ransparency, **R**esponsibility, **U**ser focus, **S**ustainability and **T**echnology: the TRUST Principles. The Principles provide a common framework to facilitate discussion and implementation of best practices in digital preservation by all stakeholders¹³

¹² Government of Canada. (2022). Frequently Asked Questions. Retrieved from Tri-Agency Research Data Management Policy: https://www.science.gc.ca/eic/site/063.nsf/eng/h_97609.html#1b

¹³ Lin, D., Crabtree, J., Dillo, I. et al. The TRUST Principles for digital repositories. *Sci Data* 7, 144 (2020). <https://doi.org/10.1038/s41597-020-0486-7>

C. RDM Strategy

The priorities identified in OHRI's RDM Strategy are based on the tools, templates, and advice provided by the Digital Research Alliance of Canada (which has absorbed the Portage Network, the previous thought leader in RDM). The Digital Research Alliance of Canada ("the Alliance") serves Canadian researchers, aiming to advance Canada's position as a global knowledge economy leader. By integrating, championing, and funding the infrastructure and activities required for advanced research computing (ARC), research data management (RDM), and research software (RS), the Alliance provides a platform for the research community to access tools and services quickly¹⁴. The Tri-Agencies endorse and recommend the work of the Alliance. Upon assessing OHRI's institutional readiness for RDM, evaluating existing RDM services, and identifying gaps in OHRI's current RDM environment, the below priorities and its linked activities define the ideal state for RDM at OHRI. The objectives identified include formalizing RDM practices, promoting the importance of data management, and guiding researchers in best practices, including creating data management plans and depositing data in appropriate repositories (per TRUST principles). Practices should be complementary to the Tri-Agency Open Access Policy on Publications. OHRI supports the broad global consensus that publicly funded research data should be made openly available as soon and with as few restrictions as possible.

Additionally, Canadian and international funders have embraced FAIR principles for data sharing (making data findable, accessible, interoperable, and reusable). FAIR acknowledges legitimate reasons for restricting access to data, such as confidentiality concerns, suggesting the need for information governance processes over usage when necessary. The application of FAIR principles may not be universally applicable to qualitative research. Qualitative research can be fully transparent and ethically responsible without making all the data available and accessible; the goal of transparency within the FAIR principles must be compatible with different epistemological positions of qualitative, quantitative, and mixed-methods research, respecting and incorporating the specificities of each. OHRI will adopt policies, guidelines and/or procedures that advance good RDM practices and evaluate/implement institutional support and training with a sustainable cost structure. The above will consider provisions for researchers working with Indigenous communities to ensure that data collected or generated from research involving Indigenous communities are managed so that the unique rights, interests, and circumstances of the specific communities affected are respected.

POLICY DEVELOPMENT				
OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
Develop institutional policies regarding RDM practice and set organizational standards for RDM across the research institute. Using ethical engagement, develop a data governance framework considering the needs of all three	Although OHRI has policies & guideline documents related to research conduct and data use and retention, the Institute does not have any policies specific to RDM.	<ul style="list-style-type: none"> • Develop an Institutional RDM Policy • Develop a communications strategy for raising awareness of institutional policies among the OHRI research community • Allocate sufficient human resources to accomplish the above 	Spring 2023 to Fall 2023	<ul style="list-style-type: none"> • RDM&S Advisory Committee

¹⁴ Digital Research Alliance of Canada. (2022). *The Alliance*. About: <https://alliancecan.ca/en/about/alliance>

<p>Indigenous Peoples groups defined in Canada's constitution (First Nations, Inuit, and Métis).</p>	<p>Currently available relevant policies/guideline documents are:</p> <p>Policies</p> <ul style="list-style-type: none"> • ADM XI 110a - Responsible Conduct of Research Policy • ADM XI 110b - Procedure for Addressing Allegations of a Breach of Responsible Conduct of Research • N2 SOP 014 09 OHRI Addendum Record Retention / Resources <p>Guidance Documents</p> <ul style="list-style-type: none"> • Authorship • Data Sharing and Stewardship • Publications 			
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BUSINESS PLANS AND SUSTAINABILITY

OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
<p>Staff RDM services are provided to the OHRI research community by formalizing & assigning RDM support responsibilities to existing (or new) staff</p>	<ul style="list-style-type: none"> • The necessary RDM services have not been identified yet • No formal RDM responsibilities have been assigned. Researchers who are aware and/or interested in RDM are seeking out OMC, OHRI's BSIT, or the Centre for Journalology on an as-needed basis. 	<ul style="list-style-type: none"> • Identify what RDM services are needed and what existing service capacity exists at OHRI • Establish a formal framework of RDM responsibility • Determine and address training needs for those responsible for RDM service provision • Allocate sufficient human resources to accomplish the above 	<p>By Spring 2023</p>	<ul style="list-style-type: none"> • RDM&S Advisory Committee • OHRI SMT
<p>Cost Model Determine whether institutional RDM services</p>	<p>There is no institutional funding dedicated specifically to RDM services</p>	<ul style="list-style-type: none"> • Assess the financial implication of the RDM strategy and 	<p>Ongoing</p>	<p>OHRI SMT</p>

can be funded through existing operational funding		institutional policies to determine resourcing needs of both		
ADVISORY SERVICES & TRAINING				
OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
<p>Advisory/Support Services Formalize the availability of advisory services and internal/external online guidance that offers relevant advice on how to comply with funder RDM requirements and institutional RDM policies; raise awareness around the availability of such services with the OHRI research community</p>	<ul style="list-style-type: none"> Guidance documents on some aspects of RDM are available in IRISGuide Centre for Journalology (CfJ) resources related to RDM topics available through the CfJ website No advisory services have been formalized; researchers reach out to OHRI Cores or specific individuals they believe have the required information OHRI's RDM survey revealed many did not previously require RDM assistance 	<ul style="list-style-type: none"> Assign RDM service support responsibility to existing OHRI staff or explore additional resourcing through new position(s) Explore support opportunities available to OHRI researchers through TOH affiliation and Ottawa U partnership Create an institutional directory (on the OHRI website, IRISGuide, or another appropriate location) to guide researchers on RDM requirements, institutional RDM policies, and related items Create an engagement strategy for reaching the OHRI research community 	By Spring 2023	<ul style="list-style-type: none"> RDM&S Advisory Committee OHRI SMT

<p>Training Facilitate access to RDM-specific training programs around best practices in research data management for OHRI researchers</p>	<ul style="list-style-type: none"> • Training on topics in data sharing is available through OHRI's Centre for Journalology (currently at no charge) and various external sources (also free for the most part). • OHRI has not made recommendations regarding types of training that should be taken or sources for such activity. 	<ul style="list-style-type: none"> • Review & recommend OHRI-vetted RDM-specific training programs around best practices in research data management. • Identify whether OHRI-specific training needs to be developed • Raise awareness of recommended training activities 	Spring 2023	
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DATA MANAGEMENT PLANNING

OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
Promote best practices in data management planning to facilitate sound research design concerning data generation and preservation. The eNOI/CRRF process flags researcher requirements to the relevant institutional support services (e.g. exceptionally large projected data volumes)	No active promotion.	<ul style="list-style-type: none"> • Develop an engagement plan for OHRI researchers around data management planning and best practices, including using data management plan templates. • Integrate working with Indigenous data • Update eNOI process • Allocate sufficient human resources to accomplish the above 	Fall 2023	<ul style="list-style-type: none"> • RDM&S Advisory Committee • OHRI BSIT • OMC

ACTIVE DATA MANAGEMENT

OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
Infrastructure	N/A	<ul style="list-style-type: none"> • BSIT provides additional storage on request to satisfy exceptional 	By Summer 2024	<ul style="list-style-type: none"> • RDM&S Advisory Committee

<p>Determine whether OHRI will need to invest in/provide additional technical infrastructure, external services (or both) to achieve its desired state of RDM practices</p>		<p>storage capacity, device networking, or performance demands. Authenticated access to storage that is protected from unauthorized data access is available</p> <ul style="list-style-type: none"> • Review of OHRI technical infrastructure to determine gaps in fulfilling researchers' requirements for RDM capacity • Create greater awareness of available technical support and services. • Provide safeguards to ensure that data is managed according to OHRI policies and Strategy • Infrastructure investment 		<ul style="list-style-type: none"> • OHRI BSIT
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APPRAISAL, RISK ASSESSMENT, & PRESERVATION

OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
<p>Data Collection Policy 1. Criteria for retaining datasets of long-term value to OHRI are defined. 2. Researchers receive tailored guidance on risk assessment and mitigation strategies that offer an appropriate level of risk control for the data they manage.</p>	<p>N/A</p>	<ul style="list-style-type: none"> • RDM criteria and corresponding guidance are developed • Allocate sufficient human resources to accomplish the above. 	<p>Fall 2023</p>	<ul style="list-style-type: none"> • RDM&S Advisory Committee
<p>Storage 1. Researchers use a storage solution that enables preservation plans, e.g., file migration or normalization, to be enacted at the time of consumption</p>	<p>N/A</p>	<ul style="list-style-type: none"> • Develop and share guidelines for the appropriate storage of research data 	<p>2023</p>	<ul style="list-style-type: none"> • RDM&S Advisory Committee

<p>or dissemination, and records all actions, migrations, and administrative processes it performs</p> <p>2. Retained data are stored with copies automatically held in two separate locations, at least one off-site</p>				
<p>Meta Data Metadata is routinely recorded on locally produced data and its links to research activity or related outputs to enhance the institution's research information quality. Community best practice standards for data access, citation, and metadata exchange are supported.</p>	<p>The RDM survey and inquiries to various OHRI service areas (grants officer, OMC, and the BSIT) suggest there is limited knowledge within the OHRI research community about best practice standards.</p>	<ul style="list-style-type: none"> • Develop and implement a process for gathering and storing metadata on locally produced data. • Develop resources & raise awareness around best practice standards for metadata. • Staff time • Funding to support technical aspects (ex., software) 		RDM&S Advisory Committee

DATA REPOSITORIES/ARCHIVING, ACCESS, & PUBLISHING

OBJECTIVE	CURRENT STATE	PLAN TO FILL GAPS & RESOURCES REQUIRED	TIMELINE	RESPONSIBLE
<p>OHRI will explore which data repositories should be recommended to OHRI researchers to support depositing and publishing open access data (i.e., does OHRI's institutional context require the development of an in-house repository, or should OHRI user external options). Partnership agreements will be</p>	<ul style="list-style-type: none"> • The RDM survey and inquiries to various OHRI service areas (grants officer, OMC, and the BSIT) suggest limited knowledge within the OHRI research community about discipline-specific and other suitable repositories. • OHRI does not promote or endorse data repositories, 	<ul style="list-style-type: none"> • Curate and disseminate information and resources to increase researchers' knowledge about available data repositories, ensuring compliance with TRUST principles. • Explore whether any local, provincial, national, or consortia agreements be considered for OHRI access data repositories. 	<p>2024</p>	RDM&S Advisory Committee

<p>considered to enable deposit in data repositories, where necessary and appropriate. Deposit in discipline-specific repositories will be encouraged if appropriate.</p>	<p>and researchers have no specific guidance on using them.</p> <ul style="list-style-type: none"> • Researchers with appointments at the University of Ottawa may access resources and repositories through this affiliation. • No partnership agreements exist. No guidance exists for researchers' data storage needs related to working with Indigenous communities. 	<ul style="list-style-type: none"> • Identify and work with experts on Indigenous data to develop tools and templates for working with Indigenous communities. 		
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