Open Access Australasia Submission to the Science System Advisory Group regarding a Science, Innovation and Technology system for Aotearoa New Zealand.

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Submitted on behalf of the Open Access Australasia Executive Committee

Open Access Australasia is a membership organisation of 24 Australian university libraries, eight Aotearoa New Zealand university libraries through the Council of New Zealand University Librarians, Creative Commons Australia, Tohatoha Aotearoa Commons, Australian Library and Information Association, Australian Digital Alliance, Wikimedia Australia, the Australian Citizen Science Association and National and State Libraries Australasia. Its mission is to attain open access to research in Australia and Aotearoa New Zealand through advocacy, collaboration, awareness, and capacity building across the Australian and New Zealand research sectors.

Phase 1

Question set 1 – The Science, Innovation and Technology System.

1. **What future should be envisaged for a publicly supported science, innovation and technology system?**

By developing a science, innovation and technology system that supports openness, innovation and experimentation Aotearoa New Zealand could be a world leader in new developments in open science, including for example incorporating approaches to artificial intelligence. A robust, diverse system of approaches to open access to research would ensure visibility and interoperability of Aotearoa New Zealand research, including Indigenous research, in the global science ecosystem. Aotearoa-led and owned journals, publishers, and data platforms meeting Australasian and international research priorities would reduce reliance on overseas infrastructure.

Such a system could be based upon:

- A nationally driven open science innovation and technology system, as advocated for by UNESCO, that enables faster access and a more coordinated and collaborative approach to maximising the value and utility of publicly-funded research.
- An open system that recognises and respects Māori Data Sovereignty, employing the principle of ‘as open as possible as closed as necessary.’
- Recognition of the full range of research outputs and the importance of all knowledge systems and supporting a diversity of avenues to open science (bibliodiversity.)
- Equity for both users to access and authors to publish open research in all its manifestations.
- An incentive structure that rewards open science practices, recognising and rewarding researchers who make their research open by aligning with principles outlined in the DORA Declaration (Declaration on Research Assessment) and the Hong Kong Principles.

Such a future for Aotearoa New Zealand’s science technology and innovation system could be attained by actions including:

- Coordinated national level policies mandating open access to publicly funded research in all its forms with robust monitoring and compliance mechanisms.
• Copyright reform to ensure researchers and institutions retain copyright ownership in publicly funded research instead of being assigned to publishers.
• Investment in specific infrastructure that maximises access to research, such as repositories based at universities and other research-producing institutions that host open access journal articles, and unique research outputs including theses, creative works and data.
• Sustainable approaches to hosting emerging forms of research in Aotearoa, including code, equipment, and software.
• Open journal platforms, pre & post print servers and other open access initiatives designed to promote open science practices
• Support and promotion of citizen science as part of open science, enhancing public engagement with science and innovation
• An open publishing system that repurposes the millions of dollars currently used to pay for access to research through university subscriptions to fund a national program of innovation in open publishing and in infrastructure for open science and open access.

2. What are the opportunities, challenges and barriers that need to be addressed to build a more thriving research, science, innovation, and technology system that delivers positive sustainable growth and prosperity for New Zealand?

The benefits of an open research system in advancing knowledge, improving transparency and reproducibility, increasing collaboration and impact and improving equity and inclusion have been documented. As is the case elsewhere, the overall challenge for the creation of an effective system for science innovation and technology for Aotearoa is to identify the most effective ways to sustainably make research open to all those who need to access it and what infrastructure is needed to deliver it. Specific challenges and barriers to implementing such a system for Aotearoa New Zealand include:

• The lack of national policies to promote and implement an integrated open research environment, including effective incentives and monitoring and compliance mechanisms. Government departments and funding agencies in the United Kingdom, United States, European Union and Latin America have already adopted open access and open science policies and mechanisms required for their implementation are being developed. In Aotearoa so far only MBIE’s 2023 Kaupapahere Rangahau Tuwhera (Open Research policy) indicates a commitment to follow suit.
• The lack of ongoing, sustainable, governmental support for the development and maintenance of national infrastructures to promote a thriving open, diverse research ecology such as repositories and publishing platforms.
• The need for copyright reform to ensure that researchers and institutions retain the rights over their work and the ability to share it openly, thereby decreasing the need to rely on expensive agreements with commercial publishers. Infrastructure - repositories - already exists to enable the effective dissemination of research once author and institutional rights retention is attained, provided adequate support is enabled.
• A research culture concerned with institutional global rankings, journal impact factors and individual researcher metrics. Prioritising such rankings in research assessment and evaluation inhibits innovation and serves to further entrench commercial interests in the dissemination of research. Moreover, the ranking system has been shown to preference already established institutions and researchers at the expense of research approaches and bodies representing marginalised groups and other knowledge systems. Such an environment is not conducive to the free exchange of knowledge and ideas that is the synergistic cornerstone of true science and innovation.
• There is a critical need for reform of research assessment and incentives. The diverse range of research outputs does not easily fit into current research assessment practices in a way that recognises their diversity and value, and that supports open research practices. We encourage consideration of research assessment principles as discussed by the DORA Declaration (Declaration on Research Assessment) and the Hong Kong Principles, in order to change research culture incentives and assessment practices to value diverse research output and Indigenous knowledges.
• As open access and open science have become more important in research overall, it has become clear that there is a need for training, both in their underpinning concepts and in their application - for example that of rights retention.

3. **What principles should underpin the design of a science, innovation, and technology system for New Zealand, given its demographic composition and distinctive cultural makeup, its geographical position, and its social, environmental and economic futures?**

We recommend the use of the UNESCO Recommendation on Open Science as the foundation for science, innovation and technology systems. The four pillars of the Recommendation incorporate areas that governments can adopt at a national level. These are:

• Open scientific knowledge, including open access to research publications and data.
• Open science infrastructure, virtual or physical, including major scientific equipment and knowledge-based resources such as collections, journals, repositories and open access publication platforms.
• Open engagement of societal actors, including with citizen science.
• Open dialogue with other knowledge systems, in Aotearoa with Mātauranga Māori and other Indigenous knowledges.

A principle-led approach based on a commitment to equity in scholarly communications, support for a diverse ecosystem of open research approaches, excellence in research, appropriate and respectful use of Indigenous knowledges and retention of rights by authors or their institutions can inform system design. In recent years many international initiatives have explored endemic inequities in the present scholarly communications system, which manifests geographical and linguistic biases including marginalising Indigenous knowledges. In considering a national approach to open science, Aotearoa has a unique opportunity to address these considerations and build a foundation that works to mitigate against such endemic inequities.

The key principles that could underlie a new science technology and innovation system for Aotearoa New Zealand are:

• Māori data sovereignty. In accordance with Te Tiriti o Waitangi, the system must respect and guarantee Māori sovereignty over Māori data and build the means to assure this in the new system. The **Māori data sovereignty principles** and the **Māori data governance model** can be used as a guide.
• **CARE** and **FAIR** principles. While the FAIR principles are concerned with greater sharing of data, the tension between opening data and the right of Indigenous peoples to control access to and uses of their data must be foregrounded. The CARE principles have been developed to guarantee Indigenous Data Sovereignty and Governance and must be central to any system designed for Aotearoa New Zealand - ‘as open as possible, as closed as necessary’ - a ‘CAREful FAIRness’.
• Rights retention and author/creator protections need to be built into the science system recognising the expanding influence in all aspects of research practice of AI and understanding that the current challenges being posed by LLMs are just the beginning.
• The principle of equity and inclusion in research, recognising that knowledge creation and access to knowledge is a human right and must be available to all.