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National Health and Medical Research Council

BUILDING
A HEALTHY
AUSTRALIA

NHMRC's Research Quality Strategy

2019



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E: nhmrc.publications@nhmrc.gov.au

P: (02) 6217 9000

Introduction

The Australian and international community expects research to be conducted responsibly, ethically and with integrity.¹ High quality research that is rigorous, transparent and reproducible maximises the opportunity for benefits to be gained.

High quality research:

- contributes to scientific progress
- is essential for the translation of research outcomes to practical and clinical applications and evidence-based policy that benefit the community
- delivers the highest possible value for research investment
- respects research participants, the wider community, animals and the environment, and
- promotes community trust in scientific findings.

Aim

The aim of the Research Quality Strategy for the National Health and Medical Research Council (NHMRC) is to ensure the highest quality and value of NHMRC-funded research through the provision of guidance and support for good research practices throughout the research cycle.

Guiding principles

This Strategy is based on the following guiding principles to ensure high quality research:

1. Respect – An open, honest and respectful research culture provides a supportive environment conducive to the conduct of high quality research.
2. Rigour – Research is underpinned by robust scientific methods and avoidance or acknowledgment of biases.
3. Transparency – Research findings, supporting data and enabling methodologies are shared and communicated openly, responsibly and accurately.
4. Accountability – Quality research is conducted in accordance with relevant legislation, policies and guidelines.
5. Innovation – Research oversight recognises the need for incremental and breakthrough innovations balanced with the need for necessary replication.
6. Efficiency – Research management processes and systems designed to support research should minimise administrative burden while promoting timely reporting and synthesis to ensure that new research is built upon sound foundations.

¹ The 'conduct' of research encompasses all stages of the research cycle including development of the research question, design, conduct, analysis and reporting.

Background

NHMRC is Australia's leading funding agency for health and medical research. Ensuring the highest quality of NHMRC-funded research is a priority for the agency and aligns with NHMRC's strategy for health and medical research.²

Issues

Reports in the international literature and the general and scientific media have highlighted the growing global concern about research quality with issues identified in many areas including:

- establishment of research questions and topics
- research design, methods and analysis
- research regulation and management
- accessibility of research information, and
- reporting of research.

Concerns about research quality have been reported across all scientific disciplines including biology, chemistry, environmental science, medicine and physics. Of particular concern are reports about avoidable waste in the production and reporting of research and the lack of reproducibility of published studies.^{3,4}

It is reasonable to assume that reported concerns about research quality apply to some NHMRC-funded research.

Reported causes of poor research quality are wide-ranging, with evidence suggesting that the common causes relate to poor research culture and questionable research practices rather than misconduct such as the deliberate fabrication or falsification of data.^{5,6}

Addressing deliberate or intentional misconduct is critical and is a matter that NHMRC takes very seriously given its potential impact. NHMRC undertakes a range of activities to manage misconduct under a framework of policies and guidelines.⁷ The focus of this Strategy is on promoting high quality research.

Context

Research is an international endeavour conducted in a complex and diverse environment, encompassing many different disciplines and methodologies. A range of economic, political, social and cultural factors can work together to create pressures and incentives that influence research practices. Ensuring research quality requires actions by multiple participants in the sector including institutions, funding agencies, researchers and ethics committees. Journals and publishers also have a role to play.

2 NHMRC Corporate Plan 2018–2019 that covers the period 2018–19 to 2021–22. <https://nhmrc.gov.au/about-us/publications/nhmrc-corporate-plan-2018-2019>

3 Chalmers I, Glasziou P. 2009. Avoidable waste in the production and reporting of research evidence. *Lancet*. 374: 86–89. [https://doi.org/10.1016/S0140-6736\(09\)60329-9](https://doi.org/10.1016/S0140-6736(09)60329-9)

4 Begley CG, Ioannidis JPA. 2015. Reproducibility in science: Improving the standard for basic and preclinical research. *Circulation Research*. 116: 116–126. <https://doi.org/10.1161/CIRCRESAHA.114.303819>

5 Academy of Medical Sciences, Biotechnology and Biological Sciences Research Council, Medical Research Council, Wellcome Trust. 2015. Reproducibility and reliability of biomedical research: improving research practice. Symposium report. <http://www.acmedsci.ac.uk/policy/policy-projects/reproducibility-and-reliability-of-biomedical-research/>

6 Collins FS, Tabak LS. 2014. NIH plans to enhance reproducibility. *Nature*. 505: 612–613. <https://doi.org/10.1038/505612a>

7 *Australian Code for the Responsible Conduct of Research, 2018 (the Code); Guide to Managing and Investigating Potential Breaches of the Australian Code for the Responsible Conduct of Research, 2018*, which outlines a model process for institutions to use to manage and investigate potential breaches of the Code; *NHMRC policy on misconduct related to NHMRC funding, 2016*.

NHMRC's role and remit are established by the *National Health and Medical Research Council Act 1992* (NHMRC Act). While NHMRC's sphere of influence is greatest with respect to NHMRC-funded research, NHMRC provides strong national leadership in research integrity and quality.

Australia's research integrity framework is underpinned by three national standards developed by NHMRC and its co-authors, the Australian Research Council and Universities Australia:

- *Australian Code for the Responsible Conduct of Research, 2018*
- *National Statement for ethical conduct in human research, 2007 (updated July 2018)*, and
- *Australian code for the care and use of animals for scientific purposes, 2013*.

The *Australian code for the care and use of animals for scientific purposes* is also co-authored by the Commonwealth Scientific and Industrial Research Organisation. Together these three standards provide guidance on responsible and ethical research conduct across all research disciplines. The overarching document is the *Australian Code for the Responsible Conduct of Research, 2018*, which establishes a framework for responsible research conduct and a foundation for high quality research across all disciplines.

NHMRC initiatives to ensure research quality

NHMRC has implemented a number of initiatives to ensure quality in the research that it funds. In addition to the establishment of a Research Quality Steering Committee to advise NHMRC about enhancing quality in NHMRC-funded research, these include:

- Review of policies and guidance for NHMRC's New Grant Program commencing 2019, with research quality being a significant element of grant assessment criteria.
- Review of peer review processes for NHMRC's New Grant Program for implementation from 2019.
- Review of the *Australian Code for the Responsible Conduct of Research (2007)* (the Code) with the revised edition released in June 2018.
- Ongoing development of supplementary guidance to support the 2018 Code including guidance about authorship, data management and dissemination of research findings.
- Update of NHMRC's *Open Access Policy* in January 2018 to include strategies to encourage data sharing and a requirement for patent applications resulting from NHMRC funding to be listed on SourceIP.
- Release of the *Best practice methodology in the use of animals for scientific purposes* in 2017 to provide guidance for high quality animal-based studies.

Strategic objectives

This Strategy builds on NHMRC's previous and current initiatives and seeks to ensure that NHMRC's approach to ensuring research quality accords with those of similar agencies internationally. Its objectives reflect the Strategy's guiding principles and focus on key areas that NHMRC can influence as the leading funding agency for health and medical research in Australia.

The objectives of the Strategy are to:

1. support a research culture in NHMRC-funded institutions that is conducive to the conduct of high quality research
2. support high quality in the development, design, methodology, conduct and analysis of NHMRC-funded research
3. support transparency of NHMRC-funded research

4. support accountability for high quality research by NHMRC-funded institutions and their institutional review committees
5. ensure the need for incremental and breakthrough innovations is balanced with the need for necessary replication, and
6. ensure NHMRC's processes are efficient while supporting high quality research.

1. Support a research culture conducive to the conduct of high quality research

The organisational climate in institutions and individual research laboratories is critical to supporting high quality research. International reports have identified drivers, enablers and barriers to excellence in research quality. However, there is little evidence about the relevance of these factors in the Australian context.

To address this information gap, NHMRC will survey NHMRC-funded institutions and researchers – including PhD students – to obtain current information about their views and their experiences within their immediate and institutional environment. The results from this survey will identify opportunities for change and innovation, inform other actions under this Strategy and provide a baseline for monitoring the effectiveness of any approaches that are implemented.

Early initiatives under this objective also aim to support and encourage improvements in research practices through:

- public recognition of institutional initiatives that ensure and promote research quality, and
- effective and continuing education and training of researchers to enable achievement of nationally (and potentially internationally) agreed core competencies for the conduct of high quality research.

NHMRC will also support institutions by providing guidance about good institutional practice for ensuring an institutional culture conducive to the conduct of high quality research.

2. Support high quality in the development, design, methodology, conduct and analysis of NHMRC-funded research

NHMRC will develop guidance for researchers, and peer reviewers of NHMRC funding applications, to ensure the rigour and reproducibility of NHMRC-funded research. Early initiatives will include developing guidance about available tools for systematic review and meta-analysis, and for improving research design for specific types of research.

3. Support transparency of NHMRC-funded research

By providing guidance for researchers about the communication and reporting of research methodology, data and findings, the aim is to improve the transparency of NHMRC-funded research in accordance with international standards. Early initiatives will include developing guidance about registration of studies.

4. Support accountability for high quality research by NHMRC-funded institutions and their institutional review committees

NHMRC will support public accountability for NHMRC-funded research by developing guidance for NHMRC-funded institutions about monitoring and reporting the quality and outcomes of research, and providing assurance to institutional review committees (including ethics committees) about the quality of the research described in applications for review by the committee.

5. Ensure the need for incremental and breakthrough innovations is balanced with the need for necessary replication

NHMRC will evaluate the effects of the implementation of this Strategy on research innovation by assessing any changes in the mix of NHMRC-funded research related to incremental and breakthrough innovations and replication research.

6. Ensure NHMRC's processes are efficient while supporting high quality research

NHMRC will review its processes to identify relevant areas where the administrative burden for the sector could be minimised. NHMRC will also consult with relevant stakeholders about improving efficiencies in sector-wide systems.

Action plan and evaluation

An action plan for the implementation of this Strategy will be developed. The action plan will include key activities, timeframes and evaluation measures and will be consistent with NHMRC's role and remit under the NHMRC Act.

Underpinning the action plan will be recognition of the differences between hypothesis-generating and hypothesis-testing research. In addition, the action plan will address the differing requirements across all of the broad research areas funded by NHMRC – basic science, clinical medicine and science, health services and public health – and for research with Aboriginal and Torres Strait Islander Peoples and communities.

New actions will be considered based on advice from the Research Quality Steering Committee, NHMRC's Principal Committees and Council and the broader research sector. Consideration will also be given to Government priorities, the national context and international activities.

Consultation and engagement

NHMRC recognises the importance of partnership with researchers and the research sector in Australia to ensure high quality research and will actively consult and engage with the sector throughout the implementation and ongoing refinement of this Strategy and associated action plan.

NHMRC will also continue to work with other international agencies and partners so that concerns about research quality can be addressed globally in a coordinated fashion.

