

International Research Integrity Policy Scan Final Report

Compilation of information about research integrity
arrangements outside Australia

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Executive Summary

The National Health and Medical Research Council (NHMRC) engaged KPMG Australia to conduct a review of research integrity arrangements in select international jurisdictions. This International Policy Scan Report (Report) describes the research integrity arrangements in these countries, and explores elements of these arrangements, noting the global landscape comprises a variety of approaches and mechanisms.

In Australia, management of research integrity relies on a system of oversight by the research sector, within a framework of national guidelines and standards. This approach is one of many research integrity governance arrangements that exists globally.

This work was directed by two research questions:

- What are the research integrity arrangements that exist in select international jurisdictions?
- What evidence exists to demonstrate the outcomes achieved and/or effectiveness to maintain and enhance research integrity within these countries?

Key concepts

Research integrity maintains trust in research, science and in the use of public funds for research. Whilst definitions of research integrity vary, the Organisation for Economic Co-operation and Development (OECD) defines research integrity as ‘an overarching term that refers to the ethos of research’. That is,

“Integrity may be attributed to individual researchers, but also to institutions or the entire research ecosystem. Research integrity refers specifically to upholding certain values, norms, and principles that constitute good scientific practice (freedom of scientific research, openness, honesty and accountability). These apply to individual researchers, research institutions and science as a social system, and to every stage of the research process”.¹

In this report, the term ‘**research integrity arrangements**’ refers to the governance, systems and processes that exist to manage research integrity.

Breaches of research integrity occur on a continuum. The most serious kind may be referred to as research misconduct and usually include (but are not limited to) fabrication, falsification and plagiarism (FFP). Less serious breaches may be referred to as questionable research practices (QRP).

Key findings

The desktop analysis of research integrity arrangements covers nine international jurisdictions. Case studies describe their respective research integrity models. An analysis of grey literature and targeted peer-review literature built a broader understanding of the various research integrity arrangements, as well as successes and limitations. Based on the evidence reviewed, the following key findings have been identified in response to the research questions.

- 1 A range of different systems exist internationally for the governance of research integrity. This diversity is attributable to multiple factors including: varied definitions of research misconduct and research integrity breaches, the size and maturity of the local research sector, internationalisation of research and collaboration preferences, norms and expectations regarding government intervention, and previous cases of research misconduct.
- 2 There is no ‘one model’ or approach adopted internationally that clearly stands out as being more effective at preventing and managing research misconduct, or other research integrity breaches. Measuring and comparing the effectiveness of each model is constrained by few (if any) consistent metrics, indicators or outcomes.

¹ OECD. *Integrity and security in the global research ecosystem*. OECD Science, Technology and Industry Policy Papers, No. 130; 2020. OECD Publishing, Paris. <https://doi.org/10.1787/1c416f43-en>

- 3 Research integrity arrangements can be classified into three types: national governance, national oversight, and self-regulated. The different models exist on a continuum and are characterised by the presence (or otherwise) of legislation or a central body, and the responsibilities and functions afforded to the central body.
- 4 Three mechanisms are generally present within governance models to enable the respective research integrity arrangements to operate effectively: a combination of a national policy and/or legislative framework; oversight mechanisms; and educational activities. The way these elements are executed, and the level of control the instruments impose, reflect the conditions relevant to a country.

These findings are expanded on below, and within this Report.

Research integrity arrangements in select international jurisdictions

Diversity and trends in research integrity governance arrangements.

Research integrity governance approaches and systems adopted internationally are heterogeneous.² Three common research integrity governance models have emerged across the nine countries explored in this Report. They can be classified into: national governance, national oversight, and self-regulation (defined in Figure 1 below). The arrangement adopted in each international jurisdiction involves a trade-off between prescriptive standards that must be followed, and standards that allow more flexibility and internal or institutional oversight than enforced compliance obligations by an external body.

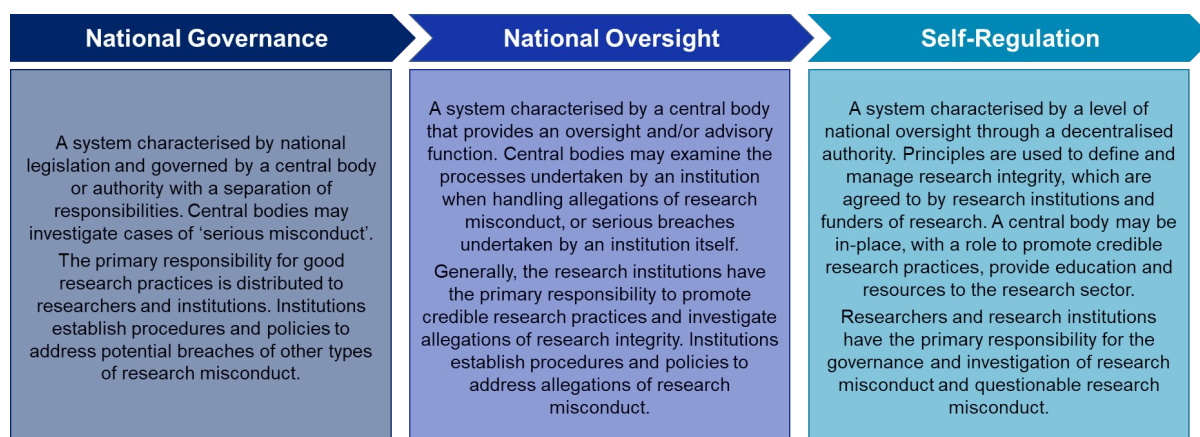


Figure 1. Types of research integrity governance arrangements

Comparison of research integrity governance systems internationally

Research integrity arrangements were investigated across nine jurisdictions. Case studies and a comparison table describes the key model, organisations and policies of these nine jurisdictions. Table 1 summarises the research integrity model present in each jurisdiction.

Table 1. Comparison of select international research integrity governance arrangements.

Jurisdiction	Research integrity governance arrangements
Canada	Canada has a national oversight model for research integrity governance. A framework is in-place that establishes responsibilities to help support and promote a positive research environment, and describes how allegations of research misconduct are investigated. ³ While three federal government granting agencies developed the framework, it sets a national standard that

² Anderson MS. Global Research Integrity in Relation to the United States' Research-Integrity Infrastructure. Accountability in Research. 2014;21(1):1-8. DOI: 10.1080/08989621.2013.822262

³ Government of Canada IAP on RC of R. Tri-Agency Framework: Responsible Conduct of Research (2021) [Internet]. rcr.ethics.gc.ca. 2021 [cited 2023 Mar 21]. Available from: <https://rcr.ethics.gc.ca/eng/framework-cadre-2021.html#a1-1>

	<p>other federal government agencies (as funders of research) may refer to in the development of their own research integrity policies.</p> <p>Research institutions promote research culture and good research practices. It is the responsibility of research institutions to investigate allegations of breaches. An independent panel reviews the final investigation report relating to allegations of research misconduct (provided from the research institution), and makes recommendations to the relevant granting agency President on appropriate recourse options.⁴</p> <p>In Canada, a breach of the framework is defined as: “Fabrication, falsification, destruction of research data/records, plagiarism, redundant publication/self-plagiarism, invalid authorship, inadequate acknowledgement and/or mismanagement of conflict of interest”.⁵</p>
Denmark	<p>Denmark has a national governance model to govern research integrity. Legislation establishes responsibilities between the Danish Committee on Research Misconduct (NVU), and publicly funded Danish research institutions.⁶</p> <p>Scientific misconduct and questionable research practices are defined in the legislation as: “Fabrication, falsification or plagiarism that has been committed intentionally or with gross negligence in the planning, execution or reporting of research. Research misconduct does not encompass instances of fabrication, falsification or plagiarism that have had little bearing on the planning, execution or reporting of the research”.⁷</p> <p>The NVU investigates allegations of misconduct that involves “scientific misconduct”. Instances of questionable research practices (QRP) are investigated at the institution-level.</p> <p>A code of conduct provides a principles-based approach to define good research practice and culture.⁸ Government organisations that fund research include adherence to the code of conduct as a condition of grant agreements and specify potential penalties for non-compliance.</p>
The Republic of Ireland	<p>The Republic of Ireland maintains a self-regulatory model to govern research integrity. A national policy statement developed by a forum of government and non-government organisations describes four commitments to foster and ensure research integrity.⁹</p> <p>Forum members may advise research institutions on investigations into allegations of research misconduct, and practices to govern and manage research integrity.¹⁰ This group does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness.</p> <p>Research institutions are primarily responsible for maintaining good research practices and investigating allegations of research misconduct.</p>

⁴ Ibid.

⁵ Ibid.

⁶ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

⁷ The Danish Ministry of Higher Education and Science. *Act on Research Misconduct* (Act No. 219 of 14 March 2017) [Internet]. Copenhagen: The Danish Ministry of Higher Education and Science; 2017 [cited 2022 Feb 23]. Available from: <https://www.retsinformation.dk/Forms/R0710.aspx?id=191269>

⁸ Danish Committee on Research Misconduct. *The Danish Code of Conduct for Research Integrity* [Internet]. Copenhagen: Danish Ministry of Higher Education and Science; 2014 [cited 2022 Feb 23]. Available from: <https://ufm.dk/en/research-and-innovation/Research-integrity-and-research-ethics/the-danish-code-of-conduct-for-research-integrity>

⁹ Policy Statement on Ensuring Research Integrity in Ireland [Internet]. Irish Universities Association; 2019 Aug [cited 2023 Mar 11]. Available from: <https://www.iaa.ie/wp-content/uploads/2021/04/National-Policy-Statement-on-Ensuring-Research-Integrity-in-Ireland.pdf>

¹⁰ Research Integrity [Internet]. Irish Universities Association. [cited 2023 Feb 14]. Available from: <https://www.iaa.ie/for-researchers/research-integrity/>

	<p>Ireland's self-regulatory model applies to publicly funded research. The national statement adopts and adapts the definitions of research misconduct and unacceptable practices from the OECD: "Fabrication of data, falsification of data and plagiarism (FFP). Furthermore, there are other unacceptable research practices, that whilst are not as serious as FFP, must be acknowledged and addressed. These include data-related misconduct, research practice misconduct, publication-related misconduct, personal misconduct and financial, and other, misconduct".¹¹</p>
Japan	<p>Japan has a national oversight model to govern research integrity. Guidelines exist for the investigation of research misconduct which must be followed for organisations that receive public funding.¹² Examples of research described in the guidelines include:</p> <ul style="list-style-type: none"> • "Fabrication, falsification or alteration of data, research records or research reports. • Plagiarism, or the appropriation of other people's research results or ideas without proper attribution. • Misappropriation or misuse of research funds, equipment, or materials. • Violation of research ethics, such as failure to obtain informed consent from human subjects, or ethical review of animal experiments. • Other acts that violate academic norms, ethics, or codes of conduct and impair the credibility of research outcomes or the trust in research activities". <p>A national office develops research integrity policy statements to establish responsibilities for good research practices at the researcher and institutional level.¹³ Researchers and research institutions have primary responsibility for maintaining good research culture.</p> <p>Funding agencies also have specific requirements under national guidelines as they award competitive research grants.¹⁴ These agencies review reports regarding investigations into research misconduct (completed at the institutional level) to ensure proper procedures were exercised and have the option to impose their own sanctions on researchers if deemed appropriate.</p>
New Zealand	<p>New Zealand has a national oversight approach to research integrity governance. A research charter document describes principles of sound research practices. Within the charter, research misconduct is addressed as an element of ethics and integrity in research.¹⁵ Poor research conduct is defined in the charter as "Research organisation actions in dealing with concerns and relates to conduct including but "not limited to plagiarism, fabrication and falsification".</p>

¹¹ Policy Statement on Ensuring Research Integrity in Ireland [Internet]. Irish Universities Association; 2019 Aug [cited 2023 Mar 11]. Available from: <https://www.iua.ie/wp-content/uploads/2021/04/National-Policy-Statement-on-Ensuring-Research-Integrity-in-Ireland.pdf>

¹² MEXT. Guidelines for Responding to Misconduct in Research [Internet]. 2014. Available from: https://www.mext.go.jp/a_menu/jinzai/fusei/_icsFiles/afieldfile/2015/07/13/1359618_01.pdf

¹³ Cabinet Office – Science and Technology Policy. Council for Science, Technology and Innovation. Policy for Ensuring Research Integrity [Internet]. 2021 [cited 2023 Feb 23]. Available from: https://www8.cao.go.jp/cstp/english/about/research_integrity.html

¹⁴ Cabinet Office – Science and Technology Policy. Council for Science, Technology and Innovation. Guidelines for Appropriate Execution of Competitive Research Funds [Internet]. 2021 [cited 2023 Feb 23]. Available from: https://www8.cao.go.jp/cstp/english/about/research_integrity.html

¹⁵ Research Charter for Aotearoa New Zealand [Internet]. Royal Society Te Apārangi. [cited 2022 Dec 20]. Available from: <https://www.royalsociety.org.nz/what-we-do/research-practice/research-charter/research-charter-aotearoa-new-zealand/>

	A Code of Professional Standards and Ethics has also been developed by a professional body that can be adopted by private and publicly funded research. ¹⁶
Singapore	<p>Singapore's research integrity arrangements follow a national oversight model. Research integrity and investigating allegations of research misconduct is the responsibility of research institutions. Whilst there is limited information on Singapore's research integrity arrangements, it appears to govern both privately and publicly funded research activities.</p> <p>A national statement defines research misconduct in Singapore as: "Fabrication, falsification or plagiarism, and other irresponsible research practices that undermine the trustworthiness of research, such as carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods".¹⁷</p> <p>Platforms exist for institutions to share experiences and findings. Funding agencies require institutions to have policies that address research integrity and misconduct.</p>
Sweden	<p>Sweden has a national governance model for research integrity. Legislation provides the distribution of responsibilities and requirements for how investigations must be handled.¹⁸ This applies to institutions receiving public funding for research. An independent national board is responsible for investigating cases of research misconduct in institutions receiving public research funding. Research misconduct under the legislation is defined as: "A serious deviation from good research practice in the form of fabrication, falsification or plagiarism that is committed intentionally or through gross negligence when planning, conducting or reporting research".¹⁹</p> <p>Monitoring other types of research misconduct, outside of this definition, and subsequent investigations (where appropriate) are managed at the research institution level.²⁰</p> <p>The national board also has a supplementary role in promoting good research practices. Funding agencies stipulate the responsibilities of researchers and research institutions in following good research practices and investigating allegations of research misconduct.</p>
United Kingdom (UK)	The UK has a self-regulation model for research integrity governance. The Concordat (an agreement between the UK government and relevant parties) provides a national framework that defines good research conduct and responsibilities of parties to promote and govern credible research practices. Signatories to the Concordat meet the commitments through policy statements, while funders of research impose conditions on research institutions through grant funding terms and conditions.

¹⁶ Code of Professional Standards and Ethics [Internet]. Royal Society Te Apārangi. [cited 2022 Dec 20]. Available from: <https://www.royalsociety.org.nz/who-we-are/our-rules-and-codes/code-of-professional-standards-and-ethics>

¹⁷ Singapore Statement on Research Integrity [Internet]. [cited 2023 Mar 10]. Available from: <https://www.singaporestatement.org/downloads/main-website/singapore-statements/224-singapore-statement-lettersize/file>

¹⁸ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

¹⁹ Act on responsibility for good research practice and the examination of research misconduct (2019:504) [Internet]. UHR.se. [cited 2023 Feb 27]. Available from: <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/act-on-responsibility-for-good-research-practice/>

²⁰ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

	<p>A national committee has an education and promotion of research integrity focus. It does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness.</p> <p>Funding agencies do not investigate allegations of research misconduct. Research institutions bear primary responsibility for research integrity practices and investigations.</p> <p>A breach of research integrity in the UK is defined as: "Fabrication, falsification, plagiarism, a failure to meet legal, ethical and professional obligations, misrepresentation of data, authorship, interests, qualifications and publication history, and the improper dealings of allegations of misconduct such as attempting to cover-up allegations, and conducting retaliation against whistle-blowers".</p>
United States of America (USA)	<p>The US maintains a national governance model. Two overarching national policies outline how research integrity is maintained in the US: the Federal Research Misconduct Policy and the Presidential Memorandum on Scientific Integrity. Both policies are only applied to Government funded research. The policies define a breach on research integrity, as: "Fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results". Final rules and regulations having legal effect relevant to each agency or organisation are codified in the Code of Federal Regulations (CFR). Variability exists across the broad organisations which maintain regulations listed in the Federal Register, notwithstanding definitions of breach of research integrity being consistent with those contained in the national policies.</p> <p>Twenty-four federal government departments and agencies have adopted scientific integrity policies that are consistent with the Presidential Memorandum on Scientific Integrity and the subsequent Memorandum to the Heads of Departments and Agencies.</p> <p>Relevant federal agencies and departments are responsible for handling allegations of research misconduct. Some do this through Offices of Research Integrity, while others have Offices of Inspectors General. Some may have no direct office and rely on reporting defined through policy and procedures.</p>

Elements of effective research integrity arrangements

Based on the available information, the literature does not point to a single model that is more effective than another across the nine countries examined. However, the evidence does point to three common features in the jurisdictions reviewed in this Report, that support robust research integrity arrangements:

- **Policy:** Guiding frameworks, codes, regulations, rules, laws, and related statements at the national and institutional levels.
- **Oversight:** Compliance and reporting obligations from researchers and institutions to national bodies. The depth and requirements of these are closely related to the policy frameworks in-place.
- **Education:** Online training modules, mentorship and on-the-ground learning driven largely at the research institution level. The content and depth of training provided is related to the nature of the overarching policy and legislation frameworks.

Introduction

Purpose

This Report provides a summary of the grey literature and targeted peer-reviewed literature on research integrity arrangements in nine international jurisdictions. It describes the common models and structures of research integrity governance approaches, and explores what is known about their effectiveness. There is also a consideration of the drivers, systemic enablers, challenges and other contextual factors associated with preventing and governing research misconduct or other breaches of research integrity.

Structure

This Report is divided into five sections (not including this section) and is accompanied by two appendices.

Scope

Two key research questions guided the literature review and structure of this Report. The key research questions this Report seeks to investigate are:

- What are the research integrity arrangements that exist in select international jurisdictions?
- What evidence exists to demonstrate the outcomes achieved and/or effectiveness to maintain and enhance research integrity within these countries?

Nine countries were selected for comparison and analysis against the research questions. The countries selected included: Canada, Denmark, Republic of Ireland, Japan, New Zealand, Singapore, Sweden, the United Kingdom, and the United States.

Approach

This report was developed using the following steps, which are expanded on below:

1. **Data collection** through grey literature search which informed the research integrity arrangements for each country selected. Peer-reviewed literature and published sources were used to validate findings.
2. **Qualitative analysis** through comparative and thematic techniques. Comparisons of identified countries' research integrity system attributes was undertaken to draw out trends, similarities and differences in each model type.
3. **Documentation of findings** using case studies approach and discussing themes that emerged through the qualitative analysis. Taxonomy diagrams have been used to compare and demonstrate the relationship between findings.

Data collection methods

KPMG conducted a search of grey literature from relevant national and international sources. Peer-reviewed literature was used to validate the findings and provide additional contextual evidence. Additional resources were identified by checking the reference list of relevant reviews, reports and literature.

Grey literature sources are documents produced at all levels of government, academia, business and industry, who are considered authorities on their content, but are not controlled by commercial publishers. For example, government and non-government organisations' commissioned research, reports and briefings are categorised as grey literature. KPMG reviewed research integrity agencies' websites to examine relevant policies and guidelines from these agencies. Where countries had legislation/s, this was also reviewed, along with discourse from relevant stakeholders such as opinion pieces from researchers and academics.

Comparative analysis

A comparative analysis of jurisdictional research integrity system attributes was undertaken. Key elements that were compared include the maturity and scope of research integrity arrangements, whether there is provision for review of the merits and/or process of any investigation and how it is provided, and key commentary surrounding jurisdictional approaches to research integrity arrangements.

The cumulative information against core elements of research integrity arrangements within each case study was compared. Similarities and differences were highlighted across each model type.

Thematic analysis

A thematic analysis broadly refers to the collection of qualitative information, such as: grey-literature and peer-reviewed literature, and its synthesis into a series of themes that can be used to answer research questions. This analysis provided an additional lens of inquiry to the comparative analysis.

A comparison of research integrity arrangements aided in the distillation of thematic analyses. Key themes of focus include:

- Research integrity systems' attributes.
- Drivers of different research integrity governance models.
- Benefits and limitations of different research integrity governance models.

Thematic analysis was primarily used to synthesise the information gathered, gain key insights and understand findings documented within this Report.

Case studies

Case studies provide a description of consistent research integrity elements within each jurisdiction. Findings were primarily drawn from grey literature and illustrate the operationalisation of the research integrity model in that country.

A set of focus areas were identified to guide the information collected and reported against within each case study. These include:

- Governance model.
- Key organisation.
- Rationale for establishment.
- Scope: misconduct, remit, responsible entity, output.
- Decision-making framework.
- Costs.
- Annual case throughput.
- Background context to the country's research integrity
- Reviews and commentary.
- Policy, process and legislative requirements.
- Graphic: structure of research integrity institutions.

Individual case studies for each country were developed to provide a description of the research integrity arrangements that exist.

Illustrative taxonomy

Due to the complex and varied nature of global research integrity models, diagrammatic representations were created to visualise the different research integrity governance arrangements and identify common attributes. These visuals can be found throughout the document, with narrative provided to discuss the thematic analysis and findings.

Limitations

The known limitations of this Report include:

- There are limited reports, literature or other information that assesses or describes elements of effective governance arrangements for research integrity.

- A review of the literature revealed there is limited information available in the public domain on some details and elements of research integrity arrangements in select jurisdictions, in particular New Zealand and Singapore.
- There was limited reliable data to assess the costs associated with the establishment and ongoing maintenance of research integrity arrangements.
- There was also limited availability of total 'annual caseloads' for some of the jurisdictions.
- Funding for all activities is aggregated such that specific functions are not easily identifiable. The sources of information available in each jurisdiction was not consistent. Given the lack of information to draw comparisons from information on funding, this was not included in the individual country case studies or summary table.
- The case studies provide a summary of research integrity governance arrangements in the selected jurisdictions. Examples have been used to demonstrate the responsibilities of funding agencies and research institutions within each arrangement (where this information was available).

Research integrity and its governance

Research integrity is essential to credible research and evidence-based decision-making

Fundamentally, research integrity maintains trust in research, science and in the use of public funds for research. Globally, definitions and concepts of research integrity are varied. One definition, offered by the Organisation for Economic Co-operation and Development (OECD), frames research integrity as ‘an overarching term that refers to the ethos of research’. That is,

“Integrity may be attributed to individual researchers, but also to institutions or the entire research ecosystem. Research integrity refers specifically to upholding certain values, norms, and principles that constitute good scientific practice (freedom of scientific research, openness, honesty and accountability). These apply to individual researchers, research institutions and science as a social system, and to every stage of the research process”.²¹

Research integrity and good research practices are essential to ensuring that quality research outputs can be relied upon to support evidence-based decisions which materially affect the individual, economy, environment and broader society.^{22 23}

Breaches of research integrity tend to be atypical and vary by degrees of severity

There are many types of misconduct and breaches of research integrity occur on a spectrum. Serious forms of misconduct include fabrication, falsification or plagiarism (FFP).²⁴ Other types of breaches may include questionable research practices (QRP).^{25 26}

All cases of research misconduct threaten the credibility and quality of research processes, data gathered, and reports published. In turn, these undermine the utility of these outputs in informing evidence-based practices, policy or validating theories.²⁷ Public confidence in the research sector is also undermined in high-profile breaches of research integrity. Research misconduct and breaches of research integrity are driven by a researcher’s behaviour in addition to the broader system and culture in which the individual operates.

Research integrity governance models have evolved to manage and prevent research integrity issues and risks

There are multiple ways for the research sector to prevent and respond to research misconduct or breaches of research integrity. Increasingly, international efforts are being driven to better define and coordinate the approach to the governance of research integrity. The 2010 Singapore Statement on

²¹ OECD. Integrity and security in the global research ecosystem. OECD Science, Technology and Industry Policy Papers, No. 130; 2020. OECD Publishing, Paris. <https://doi.org/10.1787/1c416f43-en>

²² I. P. Okokpujie et al. *The Role of Research in Economic Development*. 2018 IOP Conf. Ser.: Mater. Sci. Eng. 413 012060

²³ European Commission. Value of Research: Policy Paper by the Research, Innovation and Science Policy Experts (RISE). 2015. European Commission, Brussels. https://ec.europa.eu/futurium/en/system/files/ged/60_-_rise-value_of_research-june15_1.pdf

²⁴ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

²⁵ Banks GC, O’Boyle EH, Pollack JM, et al. *Questions About Questionable Research Practices in the Field of Management: A Guest Commentary*. *Journal of Management*. 2016;42(1):5-20. <https://doi.org/10.1177/0149206315619011>

²⁶ European Molecular Biology Organisation (EMBO). *Governance of research integrity: Options for a coordinated approach in Europe*. 2020. Heidelberg. https://www.embo.org/documents/science_policy/governance_of_ri.pdf

²⁷ John, L. K., Loewenstein, G., & Prelec, D. (2012). Measuring the prevalence of questionable research practices with incentives for truth telling. *Psychological Science*, 23(5), 524–532. doi:10.1177/0956797611430953

Research Integrity (the Singapore Statement) outlined elements of responsible research practice.²⁸ The Singapore Statement was intended to inform country-specific policy development and practical application in research integrity arrangements internationally.

Research integrity governance models facilitate greater transparency within the research sector, and positively incentivise researchers and research institutions to better self-regulate, and promote a culture of integrity and ethical practices.²⁹

²⁸ Resnik, D and Shamoo, A. *The Singapore Statement on Research Integrity*. 2011. *Account Res.*; 18(2): 71–75. doi: 10.1080/08989621.2011.557296

²⁹ Kretser, A., Murphy, D., Bertuzzi, S. et al. Scientific Integrity Principles and Best Practices: Recommendations from a Scientific Integrity Consortium. *Sci Eng Ethics* 2019;25:327–355. <https://doi.org/10.1007/s11948-019-00094-3>

Comparison of research integrity governance systems internationally

Table 2 compares research integrity systems and attributes across Australia and the nine selected jurisdictions. The table demonstrates the diversity present across different research integrity governance arrangements. As discussed earlier in this Report, this is reflective of the different political, governance and local research culture variances internationally.

	Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
1.	Model type	Self-regulation with national oversight model.	Self-regulation with national oversight model.	National governance model. It has an independent statutory body with investigatory powers.	Self-regulated model. It is a national advisory body with an education / promotion focus.	National oversight model, with a body that creates guidelines for the investigation of research misconduct.	Self-regulated model, with no separate national body or regulatory function.	National oversight model.	National governance model.	Self-regulated model.	National governance model.

	Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
2.	Summary of governance arrangements	<p>A national code of conduct has been developed by the NHMRC, ARC and Universities Australia that outlines a framework for the responsible conduct of research in Australia. Guidelines prescribe a model that institutions must follow when managing and investigating potential breaches of the code of conduct.</p> <p>As funders of research, the NHMRC and ARC stipulate research institutions must meet the code of conduct and guidelines as a condition of funding.</p> <p>The Australian Research Integrity Committee (ARIC) is administered by the NHMRC and ARC to undertake reviews of institutional processes (where requested in accordance with the ARIC Framework) to ensure institutions are appropriately managing and investigating potential breaches of the code of conduct. ARIC provides advice to the NHMRC/ARC CEO on the outcome of their review and any recommendations for the institution to action.</p>	<p>A framework is in-place that establishes responsibilities to help support and promote a positive research environment, and describe how allegations of research misconduct are investigated. Three federal government granting agencies developed the framework, it sets a national standard that other federal government agencies (as funders of research) may refer to in the development of their own research integrity policies.</p> <p>Research institutions promote research culture and good research practices. It is the responsibility of research institutions to investigate allegations of breaches. An independent panel reviews the final investigation report relating to allegations of research misconduct (provided from the research institution) and makes recommendations to the relevant granting agency President on appropriate recourse options.</p>	<p>Legislation establishes responsibilities between the Danish Committee on Research Misconduct (NVU), and publicly funded Danish research institutions. The NVU investigates allegations of misconduct that involves "scientific misconduct". Instances of QRP are investigated at the institution-level.</p> <p>A code of conduct provides a principles-based approach to define good research practice and culture. Government organisations that fund research include adherence to the code of conduct as a condition of grant agreements and specify potential penalties for non-compliance.</p>	<p>A national policy statement developed by a forum of government and non-government organisations describes four commitments to foster and ensure research integrity.</p> <p>Forum members may advise research institutions on investigations into allegations of research misconduct, and practices to govern and manage research integrity. This group does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness.</p> <p>Research institutions are primarily responsible for maintaining good research practices and investigating allegations of research misconduct.</p> <p>Ireland's self-regulatory model applies to publicly funded research.</p>	<p>Guidelines exist for the investigation of research misconduct which must be followed for organisations that receive public funding.</p> <p>A national office develops research integrity policy statements to establish responsibilities for good research practices at the researcher and institutional level. Researchers and research institutions have primary responsibility for maintaining good research culture.</p> <p>Funding agencies also have specific requirements under national guidelines as they award competitive research grants. These agencies review reports regarding investigations into research misconduct (completed at the institutional level) to ensure proper procedures were exercised and have the option to impose their own sanctions on researchers if deemed appropriate.</p>	<p>A research charter document describes principles of sound research practices. Within the charter, research misconduct is addressed as an element of ethics and integrity in research. A national code has also been developed by a professional body that can be adopted by private and publicly funded research.</p> <p>The largest providers of science research in New Zealand are the seven government-funded Crown Research Institutes (CRIs).</p> <p>These agencies and institutions have provisions that require all host institutions to establish appropriate research misconduct and integrity procedures and guidelines where grant research activities occur.</p> <p>There is limited public information available that outlines how potential breaches of responsible research conduct are linked to funding agreements.</p>	<p>Research integrity and investigating allegations of research misconduct is the responsibility of research institutions. Whilst there is limited information on Singapore's research integrity arrangements, it appears to govern both privately and publicly funded research activities.</p> <p>Platforms exist for institutions to share experiences and findings. Funding agencies require institutions to have policies that address research integrity and misconduct.</p>	<p>Legislation sets out the responsibilities and requirements for how investigations must be handled. It applies to institutions that receive public funding for research.</p> <p>An independent national board is responsible for investigating cases of research misconduct in institutions receiving public research funding.</p> <p>Funding agencies stipulate the responsibilities of researchers and research institutions in following good research practices and handling research misconduct.</p>	<p>The Concordat to Support Research Integrity provides a national framework that defines good research conduct and responsibilities of parties to promote and govern credible research practices. Signatories to the document meet the commitments through policy statements.</p> <p>Funders of research impose conditions on research institutions through grant funding agreements.</p> <p>A national committee has an education and promotion of research integrity focus. It does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness.</p> <p>Funding agencies do not investigate allegations of research misconduct. Research institutions bear primary responsibility for research integrity practices and investigations.</p>	<p>Two national policies govern research integrity in the US – the Federal Research Misconduct Policy and the Presidential Memorandum on Scientific Integrity. All federal government agencies and departments were required to implement the Policy. Twenty-four federal government departments and agencies have adopted scientific integrity policies that are consistent with the Presidential Memorandum and the subsequent Memorandum to the Heads of Departments and Agencies. These policies only apply to publicly funded research.</p> <p>It is the responsibility of federal agencies and departments to handle allegations of research misconduct. Some do this through Offices of Research Integrity, whilst others have Offices of Inspector Generals. Some may have no direct office and rely on procedures.</p>

	Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
3.	Presence of a central body	While there is no overarching central body, two main funding bodies in Australia, the ARC and NHMRC, administer and support ARIC. ARIC is an advisory committee that, on request, reviews investigation processes and makes recommendations to the CEOs of the two funding agencies.	The three funding agencies established the Interagency Advisory Panel on Responsible Conduct of Research (PRCR), an advisory panel that coordinates approaches for the promotion and maintenance of the responsible conduct of research.	The NVU is a statutory body for investigating all allegations of serious research misconduct.	National Forum on Research Integrity (NRIF) is coordinated by the Irish Universities Association and the Technological Higher Education Association. It seeks to provide both a Community of Practice for the sharing of information and best practice pertaining to research integrity, as well as a steering group that discusses matters relating to research integrity	Office for Research Integrity Promotion within Ministry of Education, Culture, Sports, Science and Technology (MEXT) coordinates policy and regulation.	No central body. The Royal Society Te Apārangi (professional society) has assumed role and developed codes in collaboration with existing research institutions.	No central body. The Singapore Institutional Research Integrity Offices Network (SIRION) that provides a platform for research institutions to share experiences and findings. The National Research Foundation (NRF) outlines the national direction for research in Singapore, and is also a funding agency. However, it is not a central body pertaining to the maintenance of research integrity.	The Board for Examination of Research Misconduct (Npof) was established to investigate serious breaches of misconduct, as outlined by the definition of research misconduct in the Act. The Board undertakes an independent investigation of research misconduct when an allegation has been made.	UK Research and Innovation (UKRI) delivers the majority of public funding for research and innovation in the UK. Its policy statements (also reflected in grant standard terms and conditions) detail the responsibilities of the UKRI, research organisations and individual researchers on the governance of good research practices and responding to allegations of research misconduct. The UK Committee on Research Integrity (CORI) is an independent, advisory committee, hosted by UKRI, which has formal responsibility for promoting research integrity across the UK, as well as building consensus and co-ownership across the system. It does not have powers to investigate or handle complaints.	Funding agencies will have their own research integrity processes and mechanisms, with some having an Office of Inspector General (OIG). An example is the Office of Research Integrity (ORI), which is responsible for maintaining research integrity that is relevant to all Public Health Service (PHS) research. It can review and monitor research misconduct investigations conducted by research that receives PHS funding.

Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
4. Other organisations in the research integrity context. This includes funding agencies, research agencies and foundations.	NHMRC. ARC.	National Research Council of Canada (NRC). Canadian Institutes of Health Research (CIHR). Natural Sciences and Engineering Research Council of Canada (NSERC). Social Sciences and Humanities Research Council of Canada (SSHRC).	Danish National Research Foundation. Practice Committees (specific to each institution).	Irish Universities Association (IUA). Technological Higher Education Association (THEA). Irish Research Council (example of a funding body)	Office for Research Integrity Promotion (MEXT). Japan Agency for Medical Research and Development (AMED). Japan Science and Technology Agency (JST). Japan Society for the Promotion of Science (JSPS).	Royal Society Te Apārangi Health Research Council (as an example of a funding body)	SIRION. Agency for Science, Technology and Research (A*STAR). NRF Ministry of Health Ministry of Education	No specific organisations were identified as funders of research or non-government organisations.	UK Research Integrity Office (UKRIO). Signatories to the Concordat include: Universities UK. Cancer Research UK Department for the Economy, Northern Ireland Higher Education Funding Council for Wales National Institute for Health Research Scottish Funding Council The British Academy UK Research and Innovation Wellcome Trust UKRI	There are 24 federal government departments and agencies that have implemented the US' research integrity policies.
5. Year of establishment	2011	2011	2017	2015	2018	2019	N/A	2020	2018	1993 (ORI)
6. Why was it established? (Detail has been included in the case studies)	High-profile cases of research misconduct and to ensure the integrity of the system in Australia.	High-profile cases of research misconduct.	High-profile cases of research misconduct.	To attract research and development investment.	Concerns of interest and technology leaks due to undue foreign influence.	No information available.	High-profile case of research misconduct.	High-profile cases of research misconduct.	2018 Parliamentary inquiry found gaps in institution-level adoption of national guidelines.	High-profile cases of research misconduct and defrauding federal grant bodies.
7. Legislative basis or leading policy instrument	Australian Code for Responsible Conduct of Research (2018) (the Code) and accompanying Guide to Managing and Investigating Potential Breaches of the Australian Code for the Responsible Conduct of Research (the Investigation Guide)	Tri-agency Framework: Responsible Conduct of Research (2021) (the RCR Framework).	Act on Research Misconduct etc (Act no. 383 of 26 April 2017). Danish Code of Conduct for Research Integrity.	National Policy Statement on Ensuring Research Integrity in Ireland.	Guidelines for Responding to Misconduct in Research (2014). Policy for Ensuring Research Integrity (2021) Act on Activation of the Creation of Science and Technology Innovation, Article 24-2.	Research Charter for Aotearoa New Zealand.	No legislative basis. The Singapore Statement on Research Integrity (2010) is a key statement that research institutions subscribe to when managing research integrity.	Act on responsibility for good research practice and the examination of research misconduct (2020).	Concordat to Support Research Integrity.	Presidential Memorandum on Scientific Integrity Federal Research Misconduct Policy.

Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
8. Types of research misconduct investigated or reviewed	Outlined in the Investigation Guide: Not meeting required research standards, FFP, misrepresentation, Research data management, Supervision, Authorship, Conflicts of interest and Peer-review	Fabrication. Falsification. Destruction of research data or records. Plagiarism. Redundant publication or self-plagiarism. Invalid authorship. Inadequate acknowledgement. Mismanagement of conflict of interest. Distinguish levels of seriousness if appropriate	FFP committed wilfully or gross negligent in planning, performing, or reporting of research. Questionable Research Practices (QRP) are handled at the institution level.	FFP. Other unacceptable research practices such as: Data-related misconduct. Research-practice misconduct. Publication-related misconduct. Personal Misconduct. Financial or other misconduct.	FFP. Misappropriation or misuse of funds Violation of research ethics Other acts that violate academic norms, ethics, or codes of conduct	The Research Charter for Aotearoa New Zealand includes that poor research conduct can include but is not limited to plagiarism, fabrication and falsification.	Not available.	FFP committed wilfully or through gross negligent in planning, performing, or reporting of research. 'Other deviations', or QRP, are handled at the institution level.	FFP. Failure to meet legal, ethical and professional obligations. Misrepresentation of data, authorship and interests. Improper dealing with allegations of misconduct.	FFP. Institutions handle reviews for other types.
9. Who conducts the initial investigation – potential breach (merit)?	Research institutions.	Research institutions.	Research institutions for QPR. The NVU for research misconduct.	Research institutions.	Research institutions.	Research institutions.	Research institutions.	Research institutions for QPR. The Npof for research misconduct.	Research institutions.	Research institutions (for ORI research).
10. What are the channels for reviews of research integrity investigations?	Procedure review – ARIC.	Merit review – research institutions. Procedure review – research institutions.	<i>Research misconduct:</i> Merit review and procedure review – NVU. <i>QRP</i> Merit and procedure review – research institutions.	Merit review – research institutions. Procedure review – no channel.	Merit review – research institutions. Procedure review – MEXT and research funding organisations.	Merit review – research institutions. Procedure review – no channel.	Merit review – research institutions. Procedure review – research institutions.	Merit review for research misconduct – National Board. Merit review for QPR – research institutions. Procedure review – appeals of the National Board's decisions can be made to Sweden's administrative courts.	Merit review – research institutions. Procedure review – no channel.	Merit review – research institutions and then the ORI Procedure review – ORI.
11. Responsible entity for maintaining the research integrity governance system	NHMRC. ARC.	Social Sciences and Humanities Research Council (SSHRC). Natural Sciences and Engineering Research Council (NSERC). Canadian Institutes of Health Research (CIHR).	Minister for Research and Education.	Irish Universities Association & Technological Higher Education Association (THEA).	Cabinet Office (and other Ministries). Office of Research Integrity Promotion – MEXT	Royal Society Te Apārangi - this is an independent entity.	The National Research Foundation, within the Prime Minister's Office, creates the national direction, policies and strategies pertaining to research.	Ministry of Education and Research.	UKRI. UK CORI.	No single national body – it is the responsibility of the US federal departments and agencies.

	Attribute	Australia	Canada	Denmark	Republic of Ireland	Japan	New Zealand	Singapore	Sweden	United Kingdom	United States of America
12.	Scope, coverage and any published data of the central body.	Publicly funded research. ARIC undertakes reviews of institutional processes used to manage and investigate potential breaches of the Code. Provide advice and recommendations to the CEO of relevant funding organisations. Publishes deidentified information on its activities (at least annually).	Publicly funded research. Institution body or Agency required to report to SRCR on each investigation including specific allegation, summary of finding(s), process and recommendations. SRCR reviews institutions reports to determine whether it meets requirements. Agencies will consider the recommendation of SRCR and the panel. Publishes deidentified data on all confirmed breaches.	Publicly funded research. Private institutions can choose to opt-in. All research misconduct cases defined in the Act are handled by the Committee (FFP). Other breaches are handled at the institution level. Publishes an annual Report with deidentified overview of settled cases studies each year.	Publicly funded research. Institution body required to provide the National Forum with data relating to breaches. Publishes an annual report with deidentified data as well as information on other activities.	Publicly funded research. Research institutions responsible for organisational structure that prevents misconduct. Responsibility on research institutions and agencies to implement policies, establish education mechanisms and offices / committees for research integrity.	Not available.	Not available.	Publicly funded research. Responsible for good research practice and investigating 'other deviations' delegated to research institutions. Statutory authority with narrow remit to investigate and make determinations about cases of FFP. Publishes an annual report with data regarding serious breaches and other deviations.	Publicly funded research. Responsible for developing strategy related to research integrity practices, provide support and advice on policies and procedures and collaborates with other bodies to identify areas for further development in the research integrity landscape.	Publicly funded research. ORI: Case summaries are published where actions were taken due to findings of misconduct. Maintains assurance program for institutional compliance.
13.	Other governance documents and frameworks	ARIC Framework (2021). The Investigation Guide.	Checklist – Inquiry and/or Investigation Reports.	N/A - all relevant documents listed above.	National Forum on Research Integrity: Structure and Terms of Reference (2022).	N/A - all relevant documents listed above.	Research institutions and agencies involved in research activities have developed codes and guidelines.	Research institutions and agencies involved in research activities have developed codes and guidelines.	N/A - all relevant documents listed above.	UK Committee on Research Integrity: Terms of Reference & Code of Conduct (2022). UKRI Policy and Guidelines on Governance of Good Research Conduct (2013). Procedure for the Investigation of Misconduct in Research (2008). Code of Practice for Research (2009).	N/A - all relevant documents listed above.

Case studies

Overview

The following case studies describe in more detail the research integrity governance systems of the selected countries summarised in Table 2. They serve to provide an understanding of country-specific context and how the taxonomy of research integrity arrangements (Figure 2) are applied in practice.

The jurisdictions represented are listed below in order of presentation.

- Canada.
- Denmark.
- Republic of Ireland.
- Japan.
- New Zealand.
- Singapore.
- Sweden.
- United Kingdom.
- United States of America.

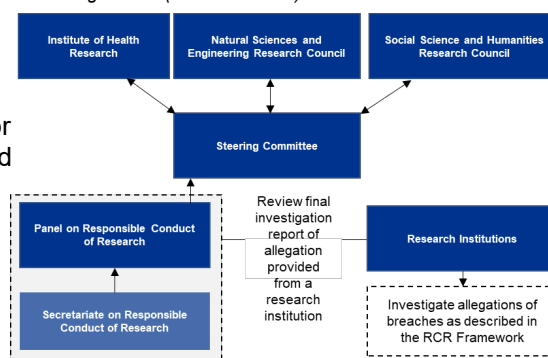
Canada

Background

Canada maintains a national oversight model to govern and manage research integrity. Three granting agencies have developed the Tri Agency Framework: Responsible Conduct of Research (RCR Framework). The RCR Framework describes the responsibilities and accountabilities for stakeholders involved in the assessment, review and outcomes resulting from allegations of breaches of agency policies.³⁰

The RCR Framework provides a standard that other federal government agencies (as funders of research) and organisation may refer to in the development of their own policies. The granting agencies require that all researchers applying for, or in receipt of, public funds comply with the RCR Framework.³¹

Figure 2. Overview of Canada's research integrity arrangements (Source: KPMG).



Research institutions promote research culture and good research practices. It is the responsibility of research institutions to investigate allegations of breaches as described in the RCR Framework. The three granting agencies have established the Panel on Responsible Conduct of Research (PRCR), supported by the Secretariat on Responsible Conduct of Research (SRCR). The PRCR reviews the final investigation report of an allegation, provided from the research institution, and provides recommendations to the granting agency President on the appropriate recourse options. The granting agency President communicates the final outcome to the research institution. Options for recourse available to the PRCR, and granting agency President are described in the RCR Framework.³²

Recent reviews and commentary on the Canada's model can be found in Figure 4.³³

Three federal government granting agencies form the tri-agencies

Three granting agencies are the main public funders Canadian research. These are: the Canadian Institutes of Health Research (CIHR); the Natural Sciences and Engineering Research Council of Canada (NSERC); and the Social Sciences and Humanities Research Council of Canada (SSHRC). Figure 2 illustrates Canada's research integrity arrangements.

To foster and maintain an environment that supports and promotes the responsible conduct of research, the RCR Framework was developed (revised in 2021). The RCR Framework describes the responsibilities and

Figure 3. Responsibilities of the tri-funding agencies to promote a positive research culture as listed in the RCR Framework (Source: the Tri-Agency Framework: Responsible Conduct of Research 2021).

The RCR Framework describes the responsibilities to meet the objectives of the RCR Framework. These include the following:

- Communicating the RCR Framework, including the contact information for those responsible for its administration.
- Responding promptly to enquiries regarding the RCR Framework.
- Helping to promote the responsible conduct of research and to assist individuals and research institutions with the interpretation or implementation of the RCR Framework.
- Reviewing and updating the RCR Framework at least every five years.
- Responding to allegations of breaches of agency policies.

³⁰ Government of Canada IAP on RC of R. Tri-Agency Framework: Responsible Conduct of Research (2021) [Internet]. rcr.ethics.gc.ca. 2021 [cited 2023 Mar 21]. Available from: <https://rcr.ethics.gc.ca/eng/framework-cadre-2021.html#a1-1>

³¹ Ibid.

³² Ibid.

³³ Honesty, Accountability and Trust: Fostering Research Integrity in Canada [Internet]. Council of Canadian Academies. 2020 Oct [cited 2022 Dec 20]. Available from: <https://cca-reports.ca/reports/honesty-accountability-and-trust-fostering-research-integrity-in-canada/>

accountabilities for stakeholders involved in the assessment, review and outcomes resulting from allegations of breaches of agency policies. Figure 3 outlines the responsibility of the tri funding agencies to meet the objective of the RCR Framework. These stakeholders include: the granting agency, research institutions, the researcher, PRCR and SRCR, expanded on below. A breach of agency policy is defined in the RCR Framework and includes the following: fabrication, falsification, destruction of research data or records, plagiarism, invalid authorship, inadequate acknowledgment or mismanagement of conflict of interest.

RCR Framework

Scope

The document describes the granting agency policies and requirements related to: applying for, and managing granting agency funds, performing research, and disseminating results. The provisions of the RCR Framework are subject to the specific terms and conditions of individual funding agreements, and the Agreement on the Administration of Agency Grants and Awards by Research Institutions between the Agencies and each research institution. The RCR Framework provides a standard that other federal government agencies (as funders of research) and organisation may refer to in the development of their own policies. The granting agencies require that all researchers applying for, or in receipt of, funds comply with the RCR Framework.³⁴

Purpose

This RCR Framework specifies the responsibilities of researchers with respect to research integrity, applying for funding, financial management, and requirements for conducting certain types of research, and defines what constitutes a breach of granting agency policies.

This RCR Framework also sets out the process to be followed by the granting agency, and administered by the Secretariat on Responsible Conduct of Research (SRCR) and the Panel on Responsible Conduct of Research (PRCR), when addressing allegations of breaches of agency policies.³⁵

Definition of research misconduct

This RCR Framework defines a breach of the Tri-Agency Research Integrity Policy as: "Fabrication, falsification, destruction of research data/records, plagiarism, redundant publication/self-plagiarism, invalid authorship, inadequate acknowledgement and/or mismanagement of conflict of interest".³⁶

Updates to the RCR Framework

The RCR Framework was revised and released in 2021, replacing the RCR Framework (2016). The revision was informed by a public consultation process. Updates to the RCR Framework include the following:

- Defining and clarifying key terminology. This includes: a definition of Responsible Conduct of Research (RCR). Clarification to the following terms: falsification; destruction of research records.
- A new responsibility for researchers regarding appropriate supervision and training in the conduct of research.
- Additional guidance on who and how many people should be involved in conducting an inquiry, and on what research institutions should consider disclosing at the end of an RCR process.

Figure 4. Reviews and commentary on the Canadian research integrity model (Source: *Honesty, Accountability and Trust: Fostering Research Integrity in Canada*).

Reviews and Commentary

Council of Canadian Academies published *Honest, Accountability and Trust: Fostering Research Integrity in Canada* (2010).

The Council of Canadian Academics (the Council) is an independent body that aims to support science-based assessments that inform the development of public policy. The Council was asked by the Government to undertake an assessment of research integrity arrangements in Canada, which forms the basis of this report.

Within this report, the Council recommends the creation of the Canadian Council for Research Integrity, which would serve as a body that focuses on the prevention of research misconduct and the promotion of research integrity. This body would not work to enforce sanctions.

³⁴ Government of Canada IAP on RC of R. Tri-Agency Framework: Responsible Conduct of Research (2021) [Internet]. rcr.ethics.gc.ca. 2021 [cited 2023 Mar 21]. Available from: <https://rcr.ethics.gc.ca/eng/framework-cadre-2021.html#a1-1>

³⁵ Ibid.

³⁶ Ibid.

- Additional criterion for institutions to consider when deciding whether to dismiss or pursue an allegation.³⁷

Research institutions

Research institutions play a role in promoting a robust research culture, as well as addressing allegations of breaches as described in the RCR Framework. There are minimum roles, responsibilities and requirements that must be met as a condition of eligibility to apply for, and hold, granting agency funding. This is described in the Agreement on the Administration of Agency Grants and Awards by Research Institutions. Institutions shall develop and administer policies to address allegations of policy breaches by researchers. The Checklist – Inquiry and/or Investigation Reports can also be utilised by research institutions when preparing their reports for the SRCR.³⁸

Figure 5. Responsibilities of research institutions to promote a positive research culture as listed in the RCR Framework (Source: the Tri-Agency Framework: Responsible Conduct of Research 2021).

Under the RCR Framework, institutions should strive to provide an environment that supports the best research and fosters researchers' abilities.

Research institutions shall do so by:

- Establishing and applying responsible research conduct policies and procedures that meet the requirements of the RCR Framework.
- Reporting to the SRCR.
- Promoting education on, and awareness of, the importance of the responsible conduct of research.

Researchers

Researchers must comply with all applicable funding agency requirements and legislation for the conduct of research in addition to institutional policies.

PRCR

The PRCR is supported by the SRCR. Consistent with the RCR Framework the PRCR has the following responsibilities:

- Reviews institutional investigation reports.
- Recommends recourse in cases of confirmed breaches, if appropriate.
- Provides advice to the Agencies on matters related to the RCR Framework.
- Provides advice to the Agencies on future revisions to the RCR Framework.

Addressing allegations of granting agency policy breaches

Role of the research institution

An institution conducts an initial inquiry to determine if the allegation is responsible and if an investigation is warranted. The Institution informs SRCR and takes immediate action. If the inquiry determines:

- No breach and SRCR is unaware of the allegation, there is no further action required. The research institution does not report findings to SRCR.
- A breach of granting agency requirements has occurred, a letter or report is submitted to SRCR, within two months of receipt of the allegation.
- An investigation is warranted, the research institution will conduct an investigation to determine the validity of the allegation. The research institution will submit an investigation report to SRCR within five months from the completion date of the inquiry.

Reporting of potential allegations, investigations underway and outcomes of the investigations are only required for researchers and research institutions that receive granting agency funding. Allegations of research misconduct within research projects funded by the private sector, by institutional endowment funds, or by other government bodies, or which was performed by a government department or agency, is not reported to the SRCR.

³⁷ Ibid.

³⁸ Government of Canada IAP on RC of R. Checklist – Inquiry and/or Investigation Reports [Internet]. rcr.ethics.gc.ca. 2019 [cited 2023 Mar 21]. Available from: https://rcr.ethics.gc.ca/eng/checklist-reports_aide-memoire-rapports.html

Role of the PRCR and SRCR

The SRCR and the PRCR will review the research institutions investigation report to determine whether it meets granting agency requirements, and whether there has been a breach of granting agency policies, and/or a funding agreement. The SRCR may follow-up with the research institution for clarification. The PRCR will recommend recourse, if appropriate, consistent with the RCR Framework.

The PRCR will present the investigation outcomes, PRCR recommendations for recourse and other outcomes to the granting agency President.

Role of the granting agency

The granting agency President will determine the recourse it considers appropriate, commensurate with the severity of the breach of granting agency policy. The granting agency President will take into consideration the PRCR's recommendations, the research institution's findings, the severity of the breach and any actions taken by the research institution and researcher involved to remedy the breach. Actions the granting agency may take include the following:

- Issuing a letter of concern to the researcher.
- Requesting that the researcher correct the research record and provide proof that the research record has been corrected.
- Terminating remaining instalments of the grant or award.
- Seeking a refund within a defined time frame of all or part of the funds already paid.³⁹

³⁹ Government of Canada IAP on RC of R. Tri-Agency Framework: Responsible Conduct of Research (2021) [Internet]. rcr.ethics.gc.ca. 2021 [cited 2023 Mar 21]. Available from: <https://rcr.ethics.gc.ca/eng/framework-cadre-2021.html#a1-1>

Denmark

Summary

Denmark has a national governance model, underpinned by legislation. The Act on Research Misconduct (2017)⁷ (the Act) establishes the division of responsibility between the Danish Committee on Research Misconduct (NVU), and publicly funded Danish research institutions. These are displayed in Figure 6.

The Act categorises types of misconduct and research practices (defined below). The NVU investigates allegations of misconduct that involves “scientific misconduct”. Instances of QRP are investigated at the institution-level. Research conducted in the absence of public funding is not covered directly by the Act.

The Danish Code of Conduct for Research Integrity⁴⁰ (the Code of Conduct) was developed and adopted in 2014. The Code of Conduct provides a common principles-based approach, to define good research practice and culture. The Code of Conduct underpins the approach taken by research institutions to promote the responsible conduct of research.

Government organisations that fund research include adherence to the Code of Conduct as a condition of grant agreements and specify potential penalties for non-compliance. These penalties and sanctions are separate to any sanctions imposed for upheld cases of breaches through the institution-level processes. Similarly, for cases upheld by NVU for serious misconduct, public funding organisations can impose their own sanctions. While not required under the Act, private research institutions (or private funding organisations) may embed similar stipulations within their agreements and contracts with researchers.

Recent reviews and commentary on Denmark’s model can be found at Figure 9.

The Act

The Act established the NVU. The Act applies to research conducted with partial or full public funding, including any research conducted at a Danish public institution, and provides obligations for researchers. Under the Act, NVU is responsible for investigating cases of serious misconduct. Research institutions have a duty to investigate cases of QRP.

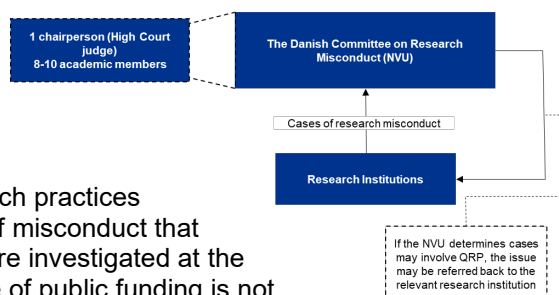
The Act establishes a clear division of responsibility⁶ between the NVU, and Danish research institutions. These include the following:

- The NVU will investigate and manage cases of scientific misconduct. It is the responsibility of the research institution to report these cases to the NVU.
- Instances of QRP will be investigated and managed by the research institution in question.

Defining scientific misconduct and QRP

Scientific misconduct and questionable research practices are defined in the Act. Scientific misconduct is defined as: “Fabrication, falsification or plagiarism that has been committed intentionally or with gross negligence in the planning, execution or reporting of research.” Furthermore, “research misconduct does not encompass instances of fabrication, falsification or plagiarism that have had little bearing on the planning, execution or reporting of the research.”⁴¹

Figure 6. Overview of Denmark’s research integrity arrangements (Source: KPMG).



⁴⁰ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. Sci Eng Ethics. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

⁴¹ The Danish Ministry of Higher Education and Science. Act on Research Misconduct (Act No. 219 of 14 March 2017) [Internet]. Copenhagen: The Danish Ministry of Higher Education and Science; 2017 [cited 2022 Feb 23]. Available from: <https://www.retsinformation.dk/Forms/R0710.aspx?id=191269>

QRP is defined as: "Breaches of current standards on responsible conduct of research, including those of the Danish Code of Conduct, and other applicable institutional, national and international practices and guidelines on research integrity".⁴²

The Code of Conduct

The Code of Conduct serves as a framework for the promotion of research integrity among researchers and research institutions. It was developed with the intent that public and private research organisations translate the Code of Conduct to operate within their own related policies and procedures.⁴³

The Code of Conduct does not provide a prescriptive set of responsibilities for researchers and research institutions, in responding to breaches of the Code of Conduct. Figure 7 is an excerpt of the Code that highlights the need for researchers to be aware of their obligations. Research institutions are required to adopt the principles in the Code of Conduct as part of their obligations under the Act, to receive public funding.⁴⁴

Figure 7. Excerpt of the Code of Conduct (Source: The Danish Code of Conduct for Research Integrity).

Addressing breaches of the Code of Conduct, as described in the document.

"Researchers should be aware of their obligation to maintain confidence in research by adequately addressing suspected breaches of responsible conduct of research. It is important for the scientific community's and the public's perception of research trustworthiness that reasonable suspicions of breaches of responsible conduct of research are brought forward and dealt with".

NVU

It is the responsibility of the NVU to investigate cases of alleged scientific misconduct (as defined in the Act).⁴⁵

Investigating cases of scientific misconduct

A research institution is obliged to report and present the case to the NVU within three months. Cases accepted for investigation by NVU must be completed within 12 months. Possible outcomes of these reviews include the following:⁴⁶

- If the NVU determines that research misconduct has not occurred but determines that a case may involve issues concerning QRP, the issue may be referred to the research institution.
- Where the NVU determines that research misconduct has occurred, the NVU, according to the Act, may decide:
 - That the researcher be required to withdraw the scientific product.
 - That the affected research institution(s) be informed of the research misconduct.
 - That the researcher's employer be informed of the research misconduct.
 - That the editor publishing the scientific misconduct be informed of the misconduct, possibly with a requirement that the editor withdraw the scientific product or take similar measures.

⁴² Ibid.

⁴³ Danish Committee on Research Misconduct. The Danish Code of Conduct for Research Integrity [Internet]. Copenhagen: Danish Ministry of Higher Education and Science; 2014 [cited 2022 Feb 23]. Available from: <https://ufm.dk/en/research-and-innovation/Research-integrity-and-research-ethics/the-danish-code-of-conduct-for-research-integrity>

⁴⁴ Ibid.

⁴⁵ Ibid.

⁴⁶ The Danish Ministry of Higher Education and Science. *Act on Research Misconduct* (Act No. 219 of 14 March 2017) [Internet]. Copenhagen: The Danish Ministry of Higher Education and Science; 2017 [cited 2022 Feb 23]. Available from: <https://www.retsinformation.dk/Forms/R0710.aspx?id=191269>

- That any foundation which has provided full or partial funding for the research carried out be informed of the research misconduct.

Decisions of NVU cases, and an Annual Report with overviews of all settled cases that take place and throughput of yearly activities, are publicly available and are published through the Ministry of Higher Education and Science. The Act further provides that the Board must include cases concerning QRP processed by research institutions, reportable to the Board through Annual Reports prepared by research institutions.⁴⁷

Funding agencies

Funding agencies (such as The Danish National Research Foundation) have specific conditions within their grant agreements regarding obligations to abide by the Code.

Actions on research institutions and researchers for non-compliance or breaches with funding agreements

Explicit requirements exist in grant agreements between grantor (funding agency) and grantees (institutions researcher/s). Terms and conditions will describe expectations for good research practices and actions that are available to funding agencies in instances of breaches. The Danish National Research Foundation includes this obligation within the “Guidelines for the budget and the financial and scientific annual report”⁴⁸ while similar terms are included in grant agreements for the Independent Research Fund.⁴⁹ Consistent with these public agencies, private funding organisations include the same type of penalties in relation to non-compliance of their Terms and Conditions, which explicitly mandates adherence to the Code (see Figure 8).⁵⁰

Research institutions

Research institutions have responsibility under the Act to promote credible research practices, manage allegations and potential breaches of QRP, and report cases of scientific misconduct to NVU.^{51 52} Research institutions develop guidelines that describe provisions for promoting good scientific research practice, and the process by which research institutions investigate alleged cases

Figure 8. Funding organisations response to non-compliance of their Terms and Conditions (Source: Novo Nordisk Foundation).

Funding organisations response to non-compliance of their Terms and Conditions

A funding organisation may choose to impose the following actions:

- Cease current and future payments.
- Require that funds already distributed be repaid.
- Prohibit the grant recipient from applying for other grants for a specified period (or indefinitely).

Figure 9. Reviews and commentary (Source: KPMG).

Reviews and commentary

Final Report on the Project ‘Practicing Integrity’ (2019)

This project received funding from the Danish Ministry of Higher Education and Research to examine how the Danish Code of Conduct for Research Integrity was being translated and implemented into the practices of institutions in Denmark. The Final Report outlined future actions that the research integrity community needed to undertake, including clarifying integrity and compliance meanings, developing institutional systems that support research integrity, and creating a forum to ensure dialogue takes place between all bodies in the research integrity policy environment.

Committee on guidelines for international research and innovation cooperation (May 2022)

Ministry of Education and Research set up a committee on guidelines for international research and innovation cooperation (URIS) in 2020 to review international research ecosystem. A key consideration underpinning the committee's recommendations was the importance promotion of research integrity and responsible research practice. The report states that fundamental principles and enforcement of good research practices can mitigate additional risks of international collaboration.

⁴⁷ Ibid.

⁴⁸ Danish National Research Foundation. Appendix 4. Guidelines for the budget and the financial and scientific annual report. [Internet]. Copenhagen (DN): Danish National Research Foundation; 2020 May 1 [cited 2023 Feb 25]. Available from: <https://dg.dk/en/guidelines-for-grant-holders-annual-reports/>

⁴⁹ Independent Research Fund. Terms and Conditions for Grants. Copenhagen (DN): Ministry of Higher Education and Science; 2012 [updated 2015 Jan; cited 2023 Feb 25]. Available from: https://dff.dk/en/application/after-having-received-a-grant?set_language=en

⁵⁰ Novo Nordisk Foundation. Conditions for Grants. Hellerup (DN): Novo Nordisk Foundation; 2022 Apr [cited 2023 Feb 25]. Available from: <https://novonordiskfonden.dk/en/how-we-work/what-are-grants/conditions-for-grants/>

⁵¹ Wright S, Degn L, Sarauw LL, Douglas-Jones R, Williams Ørberg J. Final Report on the Project “Practicing Integrity” [Internet]. Danish School of Education. 2021 [cited 2022 Dec 20]. Available from: https://dpu.au.dk/fileadmin/edu/Forskning/CHEF/Projects/Practicing_Integrity/Final_report__Practicing_Integrity.pdf

⁵² The Danish Ministry of Education and Research. Committee on guidelines for international research and innovation cooperation. Copenhagen: The Danish Ministry of Education and Research; 2022 [cited 2023 Feb 20]

of QRP.⁵³ Sanctions for upheld claims of QRP are at the discretion of the research institutions and range from compulsory training activities to academic penalties.⁵⁴

⁵³ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

⁵⁴ *Ibid.*

The Republic of Ireland

Summary

The Republic of Ireland maintains a self-regulatory model. The National Policy Statement on Ensuring Research Integrity in Ireland (the National Policy Statement) aims to provide a national framework for good research conduct and its governance. Members of the Research Integrity National Forum (the Forum – see below for membership) are responsible for meeting the four commitments described in the document through policy statements, grant funding conditions and activities that promote a robust research culture.⁵⁵

Figure 10. Research integrity arrangements in the Republic of Ireland (Source: KPMG).



Research institutions are primarily responsible for maintaining good research practices and investigating allegations of research misconduct. Forum members may advise research institutions on investigations and practices to govern and manage research integrity. However, the Forum does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness. Ireland's self-regulatory model applies to publicly funded research.

Research integrity arrangements are illustrated in Figure 10.

The National Policy Statement

The National Policy Statement⁵⁶ was jointly developed by the members of the National Research Integrity Forum (the Forum). The current membership comprises of 26 organisations and includes government departments, funders of research, peak and professional bodies and research institutions in Ireland. The document provides a framework that can be adopted across all disciplines, by all research performing organisations and funders in Ireland. Implementation of the policy is the collective responsibility of the members of the Forum.

As a collective representation of the Irish research system, the National Policy Statement describes four commitments to foster and ensure research integrity. That is:

1. "Ensuring the highest standards of integrity in all aspects of research in Ireland, founded on basic principles of good research practice to be observed by all researchers, research organisations and research funders.
2. Maintaining a national research environment that is founded upon a culture of integrity, embracing internationally recognised good practice and a positive, proactive approach to promoting research integrity. This will include support for the development of our researchers through education and promotion of good research practices.
3. Reinforce and safeguard the integrity of the Irish research system and to reviewing progress regularly.
4. Using transparent, robust and fair processes to deal with allegations of research misconduct when they arise".⁵⁷

⁵⁵ Policy Statement on Ensuring Research Integrity in Ireland [Internet]. Irish Universities Association; 2019 Aug [cited 2023 Mar 11]. Available from: <https://www.iaa.ie/wp-content/uploads/2021/04/National-Policy-Statement-on-Ensuring-Research-Integrity-in-Ireland.pdf>

⁵⁶ Ibid.

⁵⁷ Ibid.

Definition of research misconduct

The Statement adopts and adapts the definitions of research misconduct and unacceptable practices from the OECD document: Best practices for ensuring scientific integrity and preventing misconduct.⁵⁸ From this, the Statement defines serious breaches of research integrity as: “Fabrication of data, falsification of data and plagiarism. Furthermore, there other unacceptable research practices, that whilst are not as serious as FFP, must be acknowledged and addressed. These include data-related misconduct, research practice misconduct, publication-related misconduct, personal misconduct and financial, and other, misconduct”.⁵⁹

The Forum

The Forum is coordinated by the Irish Universities Association (IUA) and the Technological Higher Education Association (THEA).⁶⁰ The National Research Integrity Forum: Structure and Terms of Reference outlines the responsibilities of the Forum:

- Support the implementation of research integrity policies and across the research organisations.
- Support national research funders in implementing research integrity statements in grant conditions and associated assurance processes.
- Support the training and development programmes for researchers and staff in research institutions.
- Communicate the importance of research integrity to the Irish research community and to the general public.
- Share experiences on the number and type of instances of research misconduct that have been dealt with through investigations conducted by research institutions.

Figure 11. Example terms and conditions that may be placed on funded research institutions to enact the National Policy Statement (Source: Irish Research Council).

Irish Research Council, General Terms and Conditions for Early-Career Awards. Section 22, research governance describes requirements for research integrity. These are:

- The host institution must ensure that the highest quality of research conduct is maintained at all times throughout the award.
- The host institution shall have in-place effective systems for assuring the quality of research carried out by the awardee.
- The host institution shall have effective mechanisms for identifying research misconduct and shall have clearly publicised and agreed procedures for investigating allegations made of such misconduct.
- The host institution shall ensure that the awardee complies with the European Code of Conduct for Research Integrity, the National Policy Statement on Ensuring Research Integrity in Ireland and any other guidance the Irish Research Council may release in relation to research integrity.
- The host institution shall ensure that the awardee and academic supervisor or mentor (as relevant) has received appropriately certified training in research integrity within six months of the date of commencement of the award. Failure to ensure that this is the case may result in reduction, suspension or termination of the award.
- The host institution shall as soon as possible furnish to the Irish Research Council, in writing, details of any proven allegation of research misconduct directly or indirectly relating to the award.

Research institutions

Research institutions (including those as members of the Forum or if receiving public funding through a Forum member) are required to support the training and development of their staff to ensure they engage in credible research practices.

Addressing allegations of research misconduct

It is the responsibility of research institutions (including those as members of the Forum or if receiving public funding through a Forum member) to investigate allegations of research misconduct. The National Policy Statement describes a series of principles for investigations. The internal policies, procedures and processes are relied upon to investigate allegations of research misconduct appropriately.

⁵⁸ OECD. Integrity and security in the global research ecosystem. OECD Science, Technology and Industry Policy Papers, No. 130; 2020. OECD Publishing, Paris. <https://doi.org/10.1787/1c416f43-en>

⁵⁹ Ibid.

⁶⁰ Research Integrity [Internet]. Irish Universities Association. [cited 2023 Feb 14]. Available from: <https://www.iua.ie/for-researchers/research-integrity/>

Under grant conditions, research institutions are required to report the findings of any proven cases of research misconduct to funding bodies. This reporting may occur earlier depending on the nature of the allegation.

Public funders of research

Public research funders require research institutions to establish an approach to promote and maintain credible research practices as a condition of grant funding. Members of the Forum that are public funders of research use grant conditions as a mechanism to implement the commitments in the National Policy Statement. Figure 11 shows an example of these conditions used for Early-Career Researchers⁶¹ grants by the Irish Research Council. Provisions for the quality of research and research integrity are referred to in the terms and conditions.

⁶¹ General terms and conditions for early career awards [Internet] Irish Research Council. Available from: https://research.ie/assets/uploads/2017/07/IRC-Early-Career-TCs_August-22_.pdf

Japan

Summary

Japan has a national oversight model in place to govern and manage research integrity. The Ministry of Education, Culture, Sports, Science and Technology (MEXT) instituted guidelines for the investigation of research misconduct which must be followed for organisations that receive public funding. MEXT established the Office of Research Integrity Promotion in 2013 to coordinate activities on responsible research. The Office of Research Integrity Promotion develops policy to ensure greater responsibility for good research practices at the researcher and institutional level and ensures enforcement for potential breaches.⁶²

Figure 12. Overview of Japan's research integrity arrangements (Source: KPMG).

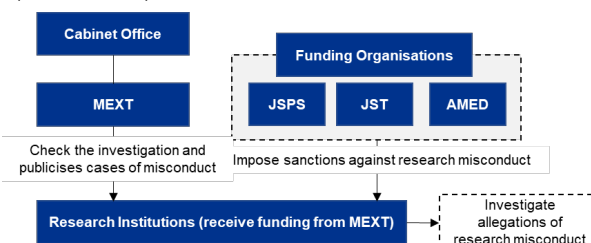


Figure 12 illustrates Japan's research integrity arrangements.

Researchers and research institutions have primary responsibility for maintaining good research culture. The Guidelines for Responding to Misconduct in Research⁶³ (the Guidelines) mandate: any research institution that receives public funding through agreements, or competitive research grants administered by funding agencies, must establish processes for investigating potential breaches. These methods and procedures need to be transparent and adopted at the local level, incorporating key provisions in the Guidelines.

Funding agencies also have specific requirements under the Guidelines as they award competitive research grants.⁶⁴ These agencies must review reports regarding investigations into research misconduct (completed at the institutional level) to ensure proper procedures were exercised and have the option to impose their own sanctions on researchers if deemed appropriate in consideration of the nature of the breach. There is a recent trend within government policy, reviews and reports to discuss research integrity in the context of knowledge security and economic growth in Japan.

Recent reviews and commentary on Japan's model can be found in Figure 14.^{65 66 67 68}

Concepts of research integrity in the Japanese context

Research integrity is linked with economic prosperity and knowledge security in government policy statements. The Japanese Government has acknowledged new risks associated with internationalism and the openness of research.⁶⁹ The Policy for Ensuring Research Integrity⁷⁰ (the Policy) outlines the potential damage that undue foreign influence has on research integrity in Japan, and noted actions that the US, UK and Australia were taking to strengthen their research integrity.

⁶² MEXT. Guidelines for Responding to Misconduct in Research [Internet]. 2014. Available from: https://www.mext.go.jp/a_menu/jinzai/fusei/_icsFiles/afiedfile/2015/07/13/1359618_01.pdf

⁶³ Ibid.

⁶⁴ Ibid.

⁶⁵ Chou C, Lee I J & Fudano J. The present situation of and challenges in research ethics and integrity promotion: Experiences in East Asia. *Accountability in Research*. 2023; doi: 10.1080/08989621.2022.2155144

⁶⁶ Suzuki K. Understanding Japan's Approach to Economic Security. *Stimson* [Internet]. 2023 Feb 10 [cited 2023 Feb 23]. Available from: <https://www.stimson.org/2023/understanding-japans-approach-to-economic-security/>

⁶⁷ Mallapaty S. Japan considers tougher rules on research interference amid US-China tensions. *Nature* [Internet]. 2020 [cited 2023 Feb 23]. doi: 10.1038/d41586-020-02273-w

⁶⁸ Yuan C & Yong Z. Procedures and Principles of Disposal of Research Misconduct in Japan From the Perspective of Case Analysis. 11(4):215824402110591. 2021. *SAGE Open*. doi: 10.1177/21582440211059173

⁶⁹ Cabinet Office – Science and Technology Policy. Council for Science, Technology and Innovation. Research Integrity Investigation and Analysis Report. 2020. PricewaterhouseCoopers Aarata LLC. Available from: https://www8.cao.go.jp/cstp/english/doc/report_en.pdf

⁷⁰ Cabinet Office – Science and Technology Policy. Council for Science, Technology and Innovation. Policy for Ensuring Research Integrity [Internet]. 2021 [cited 2023 Feb 23]. Available from: https://www8.cao.go.jp/cstp/english/about/research_integrity.html

The Policy

The Policy signals the Japanese Government's push for transparency and accountability from researchers and research institutions. The policy direction involves bolstering disclosure requirements by researchers, strengthening management processes within research institutions and revision of guidelines for competitive research grants in cooperation with public funding agencies.

The Guidelines

The Guidelines outline measures research institutions must follow when handling research misconduct. Institutions are encouraged to undertake incentives that prevent research misconduct. Figure 13 summarises examples of research misconduct referred to in the Guidelines. This document is applicable to research activities for organisations that receive public funding, through all government funding channels (grants, funding agencies and foundations, or Ministries).

Figure 13. Examples of research misconduct referred to in the Guidelines (Source: The Guidelines for Responding to Misconduct in Research).

Examples of research misconduct as described in the Guidelines.

- Fabrication, falsification or alteration of data, research records or research reports.
- Plagiarism, or the appropriation of other people's research results or ideas without proper attribution.
- Misappropriation or misuse of research funds, equipment, or materials.
- Violation of research ethics, such as failure to obtain informed consent from human subjects, or ethical review of animal experiments.
- Other acts that violate academic norms, ethics, or codes of conduct and impair the credibility of research outcomes or the trust in research activities.

Act on Activation of the Creation of Science and Technology Innovation

The Executive Ordinance for Enforcement of the Act on Promotion of Science and Technology (2018) provides that recipients of Government funding for research activities must maintain appropriate systems to ensure responsible conduct of research and investigating cases of misconduct.

MEXT and the Office of Research Integrity Promotion

MEXT and the Office of Research Integrity Promotion are responsible for implementing policies and systems based on the Guidelines. MEXT also coordinates initiatives across the research ecosystem and provides advice on research integrity. MEXT monitors adherence to the Guidelines through periodic surveys of research institutions, as well as mandatory reporting requirements. Gap analyses and action plans are issued by MEXT in collaboration with the research institution in instances of non-compliance. If the actions are not met within set timeframes, MEXT may impose sanctions by reducing grant funding.⁷¹

Research Institutions

Under the Guidelines research institutions are required to address three main elements:

1. The management responsibilities of research institutions.
2. Establishing organisational structures.
3. Responding to specific research misconduct.

These obligations are met through organisational wide policy statements, the appointment of a Responsible Conduct of Research (RCR) education officer, and forming an investigating committee to handle cases of potential misconduct.

Actions on researchers

Where cases of research misconduct are upheld, research institutions may take several actions dependant on the type and severity of a breach. There are no prescriptive measures in leading policy documents, but research institutions are required to make these clear in their own codes and guidelines.

⁷¹ Note: indirect cost grants are used to fund institutions through public expenditure. Japan has a 30% flat-rate for all institutions
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Actions may range from: remedial education and training to improve understanding of research integrity, to disciplinary measures including termination of employment. Outcomes of an investigation are required to be reported to the Office of Research Integrity Promotion. Violations of other laws outside of those relating to research integrity must also be reported to relevant regulator or law enforcement.

Funding agencies

The agencies operate cooperatively in the research network with key organisations including MEXT, other Ministries, research institutions, researchers, and non-for-profits in the research community. Each funding agency has dedicated resources for maintaining standards for research integrity and has their own office for managing and administering policies. The funding agencies drive the promotion of good research practices to the sector through education and information sharing initiatives.⁷² Activities include symposiums, workshops, seminars, and courses which are disseminated through their information portals and network of research integrity officers.

Funding agencies are not an investigative body. Funding agencies may choose to take additional actions against researchers where allegations are upheld. Some of these include:

- Partial or full discontinuation of research activities.
- Rejection of pending proposals.
- Partial or full return of funds.
- Restriction periods for participation or application for agency funded projects – these are determined by the classification and degree of misconduct.
- Any other penalty that the agency deems necessary.

Figure 14. Reviews and commentary of Japan research integrity (Source: KPMG).

Reviews and commentary

The present situation of and challenges in research ethics and integrity promotion: Experiences in East Asia (Jan 2023)

An article discussing the current research integrity landscape in Japan, Taiwan, and Korea.³⁹ In Japan there are challenges with implementing more active arrangements and requirements at the institution-level, such as lack of qualified personnel. This is due to persons in RCR roles having to take on multiple responsibilities in the integrity and ethics space within the organisation, which at times may be in conflict.

Understanding Japan's Approach to Economic Security (Feb 2023)

This commentary looks at the expanding concept of 'Economic Security' in Japan's policy landscape. Protection and security of information are referred to in terms of economic and national security. Increasingly, policies and Government dictums regarding research integrity matters are viewed as security issues.

Japan considers tougher rules on research interference amid US-China tensions (Aug 2020)

This article in Nature discusses the Government of Japan's policies regarding the decision to strengthen research integrity guidelines to protect strong international ties with US research organisations.

The Council for Science, Technology and Innovation (CSTI): an agency within the Cabinet Office and chaired by then Prime Minister Abe – approved the 2020 innovation strategy: "Which asks government agencies, research institutes and companies to strengthen codes of conduct around research integrity and conflicts of interest, and prevent the outflow of sensitive research and technologies".

Procedures and Principles of Disposal of Research Misconduct in Japan from the Perspective of Case Analysis (Oct 2021)

This document claims that Japan's system of self-regulation is relatively mature, and its governance framework for research integrity and investigations is considered complete and official compared to other countries who also follow a system of self-regulation.

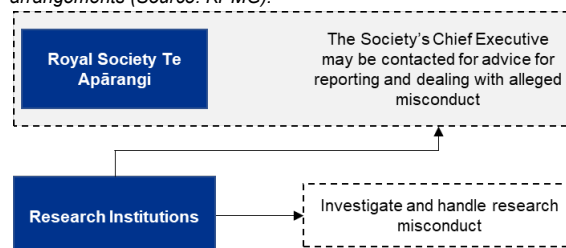
⁷² Cabinet Office – Science and Technology Policy. Council for Science, Technology and Innovation. Research Integrity Investigation and Analysis Report. 2020. PricewaterhouseCoopers Aarata LLC. Available from: https://www8.cao.go.jp/cstp/english/doc/report_en.pdf

New Zealand

Summary

New Zealand has a principles-based approach to research integrity governance. The Research Charter for Aotearoa New Zealand (the Charter)⁷³ describes principles of sound research practices. Research misconduct is addressed in the Charter as an element of ethics and integrity in research. Figure 15 illustrates New Zealand's research integrity arrangements. The scope of the model includes a Code that can be adopted by private and publicly funded research. But the Code is optional.

Figure 15. Overview of New Zealand's research integrity arrangements (Source: KPMG).



The Charter sets out principles that underpin sound research in New Zealand. It describes good research practices and was created for research organisation to draw upon as they develop, refine and implement their own research integrity policies and processes.

Poor research misconduct defined in the Charter

Whilst there is no clear, national definition of a breach of research integrity in New Zealand, the Charter states: "Poor research conduct can include but is not limited to plagiarism, fabrication and falsification".⁷³

The Royal Society of New Zealand's Code of Professional Standards and Ethics (the Code)

The Code was developed by the Royal Society (see Figure 16) and sets out values and principles that guide research conduct for members of the professional association. It establishes transparent standards to support public trust and promote: a "rights-based knowledge discovery between researchers, participants and communities to advance science, technology, and the humanities in Aotearoa New Zealand".⁷⁴

The Code is intended to be interpreted within a general framework and provides additional obligations and responsibilities in carrying out professional duties. The Charter and the Code are aligned in the described principles of credible research practices, and values for promoting good research.

Figure 16. Purpose of the Royal Society Te Apārangi (Source: Royal Society Te Apārangi).

The Royal Society Te Apārangi

Royal Society of New Zealand Act 1965 constituted the Society for the purpose of advancing and promoting science, technology and the humanities in New Zealand.

It also seeks to establish and administer for members a code of professional standards and ethics in science, technology, and the humanities.

It provides infrastructure and other support for the professional needs of scientists, technologists and humanities.

Research institutions

Research institutions are responsible for operationalising the Charter. Institutions must establish their own policies, guidelines and governance frameworks to ensure researchers and institutions maintain good research practices. The development of training and knowledge material, as well as uplifting processes complements frameworks for investigating potential cases of poor research practice.

⁷³ Research Charter for Aotearoa New Zealand [Internet]. Royal Society Te Apārangi. [cited 2022 Dec 20]. Available from: <https://www.royalsociety.org.nz/what-we-do/research-practice/research-charter/research-charter-aotearoa-new-zealand/>

⁷⁴ Ibid.

Investigating allegations of misconduct

The investigation of allegations of misconduct in research is the duty of the research institutions.

Individual policy documents relating to a particular organisation provide details on the scope of such an inquiry, types of violations, composition of specialist review panel (where relevant) and other processes that may occur in the course of the review. Procedural documents specify who they apply to and under what circumstances. This includes any frameworks used to impose punitive measures or penalties that an organisation may rely on should the case be upheld.

Funding agencies

New Zealand has a number of public and private funding agencies that engage with the research sector. The largest providers of science research in New Zealand are the seven government-funded Crown Research Institutes (CRIs).⁷⁵ These agencies and institutes are set up under various arrangements which have policies that outline ethical conduct requirements as part of a CRI. The Ministry of Business, Innovation & Employment (MBIE) has portfolio responsibility for research policy. These agencies and institutions have provisions that require all host institutions to establish appropriate research misconduct and integrity procedures and guidelines where grant research activities occur.

An example of a funding agency is the Health Research Council, which outlines the following statement in its research ethics guidelines: “Individual host institutions should ensure that there are appropriate guidelines for the conduct of research and procedures for dealing with allegations of misconduct in research.”⁷⁶ There is limited public information available that outlines how potential breaches of responsible research conduct are linked to funding agreements.

⁷⁵ Science New Zealand. About – Overview of New Zealand’s science system [Internet]. [cited 2023 Feb 9]. Available from: <https://sciencenewzealand.org/about/new-zealand-science-systems/>

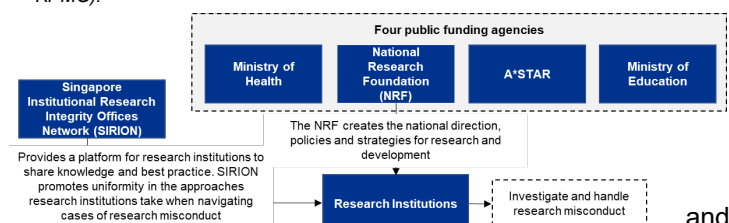
⁷⁶ HRC Research Ethics Guidelines [Internet]. Health Research Council of New Zealand. 2021 Mar [cited 2023 Mar 11] p. 29. Available from: https://gateway.hrc.govt.nz/funding/downloads/HRC_research_ethics_guidelines.pdf

Singapore

Summary

Singapore's research integrity arrangements follow a national oversight model. Research integrity and investigating allegations of research misconduct is the responsibility of research institutions. While there is limited information on Singapore's research integrity arrangements, both privately funded and publicly funded research institutions appear to be engaged in Singapore's arrangements. In 2016, a high-profile case of research misconduct at Nanyang Technological University (NTU)⁷⁷ resulted in research integrity professionals launching a professional network to discuss research integrity. This network is known as the Singapore Institutional Research Offices Network (SIRION). Figure 17 illustrates Singapore's research integrity arrangements.

Figure 17. Overview of Singapore's research integrity arrangements (Source: KPMG).



Definition of research misconduct

Whilst there is no clear, national definition of a breach of research integrity in Singapore, A*STAR and three key Singapore research institutions have publicly committed to abiding by the Singapore Statement of Research Integrity (the Statement). The Statement suggests research misconduct includes the following: "Fabrication, falsification or plagiarism, and other irresponsible research practices that undermine the trustworthiness of research, such as carelessness, improperly listing authors, failing to report conflicting data, or the use of misleading analytical methods".⁷⁸

The Singapore Institutional Research Integrity Offices Network (SIRION)

SIRION provides a platform for Singaporean research institutions to share experiences, findings and best practices, and seeks to build a culture of quality and integrity in the research sector.⁷⁹ This aims to promote uniformity in the approaches that institutions take when navigating cases of research misconduct. The members of SIRION are listed in Figure 18.

Funding organisations

Four agencies provide public funding for research, each with a discipline specific focus. These are:

- National Research Foundation.
- Ministry of Health.
- Ministry of Education.

Figure 18. SIRION Members (Source: Singapore Institutional Research Integrity Offices Network).

SIRION Members

Members

- Agency for Science, Technology and Research (A*STAR).
- Nanyang Technological University.
- National University of Singapore.
- Singapore Institute of Technology.
- Singapore Management University.
- Singapore University of Social Sciences.
- Singapore University of Technology and Design.
- National Healthcare Group.
- National University Health System.
- SingHealth.

Observers

- Ministry of Education.
- Ministry of Health.
- National Research Foundation.

⁷⁷ Chawla DS. Singapore university revokes second researcher's PhD in misconduct fallout [Internet]. Retraction Watch. 2017 [cited 2023 Feb 27]. Available from: <https://retractionwatch.com/2017/10/31/singapore-university-revokes-second-researchers-phd-misconduct-fallout/>

⁷⁸ Singapore Statement on Research Integrity [Internet]. [cited 2023 Mar 10]. Available from: <https://www.singaporestatement.org/downloads/main-website/singapore-statements/224-singapore-statement-lettersize/file>

⁷⁹ Research Integrity Conference [Internet]. [www.researchintegritysingapore.org.sg](http://www.researchintegritysingapore.org.sg/home.asp). [cited 2023 Feb 27]. Available from: <http://www.researchintegritysingapore.org.sg/home.asp>

- The Agency for Science, Technology and Research (A*STAR).

National Research Foundation (NRF)

The NRF resides within the Singaporean Prime Minister's Office. The goal of the NRF is to determine the national direction for research and development in Singapore.⁸⁰ The NRF also provides funding towards research that helps strengthen Singapore's research and science capabilities.

The NRF has a National Research Fund Guide⁸¹ that outlines grant conditions applicable to NRF funded research. These grant conditions acknowledge that it is the primary responsibility of the researcher to ensure they maintain research integrity. Research institutions are responsible for promoting and ensuring researchers comply with the relevant standards pertaining to research integrity. The NRF states its requirement for research institutions to have policies in-place that outline the responsible conduct of research, and how research misconduct is prevented and managed within the organisation.

Research Institutions

Research institutions will implement codes, policies, and procedures that outline their commitment to creating a strong research culture of integrity and professionalism and provide guidance on the appropriate conduct of research and on handling allegations of research misconduct. This is often to comply with grant conditions of funding agencies.

It is the responsibility of research institutions to undertake assessments and formal inquiries into allegations of research misconduct. It is also the responsibility of the research institution to decide on appropriate sanctions, if any, to impose on respondents who have been proven to have engaged in research misconduct. Research institutions are often required to have whistle-blower protection mechanisms and provide confidential communication channels for members of the research institution and external parties who have reason to believe that any form of misconduct has taken place.

⁸⁰ Corporate Profile [Internet]. www.nrf.gov.sg. Available from: <https://www.nrf.gov.sg/about-nrf/national-research-foundation-singapore>

⁸¹ National Research Fund Guide [Internet]. National Research Foundation; 2017 [cited 2023 Jan 17]. Available from: [https://www.a-star.edu.sg/docs/librariesprovider1/default-document-library/research/funding-opportunities/lcer-fi-grant-call/annex-c3---national-research-fund-guide-\(with-effect-from-1-jul-2016\).pdf](https://www.a-star.edu.sg/docs/librariesprovider1/default-document-library/research/funding-opportunities/lcer-fi-grant-call/annex-c3---national-research-fund-guide-(with-effect-from-1-jul-2016).pdf)

Sweden

Summary

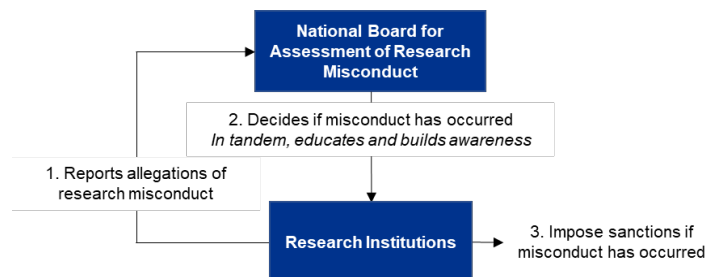
Sweden has a national governance model, with an independent statutory body with investigatory powers. The Act on responsibility for good research practice and examination of research misconduct (the Act) is legislation that provides the distribution of responsibilities and requirements for how investigations must be handled. The Act applies to institutions that are receiving public funding for research.

Under the Act, The National Board for Assessment of Research Misconduct (the National Board) is responsible for investigating cases of research misconduct in institutions receiving public research funding. Research misconduct under the Act is defined as: "A serious deviation from good research practice in the form of fabrication, falsification or plagiarism that is committed intentionally or through gross negligence when planning, conducting or reporting research".⁸²

The Board has a supplementary role in promoting good research practices and builds trust in the research integrity arrangements. Under the Act institutions receiving public funding for research are required to implement policies that prevent breaches of 'good research practices' and investigate breaches that are not considered research misconduct.⁸³

Figure 19 illustrates Sweden's research integrity arrangements. Recent reviews and commentary on Sweden's model can be found in Figure 21.^{84 85}

Figure 19. Research integrity arrangements in Sweden (Source: KPMG).



Act on responsibility for good research practice and examination of research misconduct

Under the Act, all researchers and research institutions have a responsibility to ensure that research is undertaken according to 'good scientific practices'. This includes the following:

- You shall tell the truth about your research.
- You shall consciously review and report the basic premises of your studies.
- You shall openly account for your methods and results.
- You shall openly account for your commercial interests and other associations.
- You shall not make unauthorised use of the research results of others.
- You shall keep your research organised, for example through documentation and filing.
- You shall strive to conduct your research without doing harm to people, animals or the environment.
- You shall be fair in your judgement of others' research.⁸⁶

It also regulates how cases of research misconduct are handled, described further below.

⁸² Act on responsibility for good research practice and the examination of research misconduct (2019:504) [Internet]. UHR.se. [cited 2023 Feb 27]. Available from: <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/act-on-responsibility-for-good-research-practice/>

⁸³ Ibid.

⁸⁴ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

⁸⁵ Else H. Swedish research misconduct agency swamped with cases in first year. *Nature*. 2021 Sep 13;597(7877):461–1

⁸⁶ Act on responsibility for good research practice and the examination of research misconduct (2019:504) [Internet]. UHR.se. [cited 2023 Feb 27]. Available from: <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/act-on-responsibility-for-good-research-practice/>

The National Board

The National Board was established in 2019, as a result of reform to increase public trust in research practices after the high-profile Macchiarini fraud case.⁸⁷

The National Board only investigates breaches covered by the definition of research misconduct, as defined in the Act. Research institutions are required to submit cases of suspected research misconduct to the Board. The Board will initiate an independent investigation into the allegation of research misconduct. The organisation has a role in education and the promotion of good research practices. The Board will also advise institutions on issues relating to FFP. It is the responsibility of the research institutions to investigate all other allegations of research misconduct that do not meet the above definition.

Publicly funded researchers and research institutions are required to abide by these procedures. The National Board has no authority to impose direct sanctions and makes no decisions on penalties. If a case of serious misconduct is found to have occurred, research institutions must report back to the Board within six months. Reporting must include a summary of measures and actions that have been implemented in response to the National Board's findings.

The National Board prepares an Annual Report that summarises the volume of investigations, types of misconduct they encounter, and details of the progress of cases. Figure 20 provides a summary of the National Board throughput in 2022. These statistics are illustrated in a dashboard, available on the National Board's website.⁸⁸

The National Board also publishes decisions on select research misconduct cases. In the documents accessible online, names of complainants and respondents are redacted. The decisions include a summary of the case and the grounds for decision.

Funding organisations

Public funding of research in Sweden is distributed through funding agencies and research foundations. Grant funding agreements stipulate the responsibilities of researchers and research institutions to follow good research practices and reporting allegations of serious misconduct. The Act does not provide guidance or outline responsibilities of the funding organisations.

Research institutions

The Act states that research institutions are required to uphold 'good research practices' and engage in preventative work. This involves implementing processes and conditions to ensure a culture of credible research practices can be maintained. Institutions provide education and training initiatives amongst researchers and all staff to build and promote a strong research culture.

Figure 20. 2022 National Board activity (Source: The Swedish National Board for Assessment of Research Misconduct).

2021 throughout and activities of the Board.

In 2022, the National Board:

- Received 47 cases.
- Reached a decision in 25 cases.
- 89% of decisions were 'innocent' and 11% of decisions were 'guilty'.⁵¹

Figure 21. Reviews and commentary (Source: KPMG).

Reviews and commentary

Swedish research misconduct agency swamped with cases in first year (2021)

The review examined the high volume of misconduct handled since the establishment of the Board. The high number of complaints were driven by several factors including: those individuals were more comfortable raising concerns since an independent body was established, and greater awareness of good research practice empowered individuals to raise allegations.⁸⁷

Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia (2022)

The author outlines the purpose, scope and responsibilities of key groups within Sweden's research integrity system. The Swedish system centres on individual researcher responsibility and recognises the 'limited capacity of governments to regulate' less severe instances of integrity breaches. The law is explicit in describing the 'changing nature of research' as a driver to minimise excessive government intervention.⁶

⁸⁷ Else H. Government takes on fraud. Nature [Internet]. 2019 [cited 2023 Feb 20]; Available from: <https://www.nature.com/articles/d41586-018-05493-3.pdf>

⁸⁸ Statistics [Internet]. Nämnden för prövning av oredlighet i forskning. [cited 2023 Feb 27]. Available from: <https://npof.se/en/statistics/>

Responding to allegations of research misconduct

Research institutions are required to implement appropriate processes that support the handling of allegations of research misconduct, including secure whistle blower avenues and protection.⁸⁹ Research institutions are required to report serious breaches to the Board, where an independent investigation will be initiated. If the breach is not FFP, the institution must undertake their own investigation.

Where the Board finds that research misconduct took place, research institutions are required to report back to the Board on how they will address the case of misconduct.

Researchers

All researchers must follow and enforce 'good research practices' according to the Act. This involves researchers ensuring they adequately understand all laws, policies, procedures and codes of conduct of their respective institution that are relevant to research integrity and misconduct, as well as attending any training provided by their respective institution.⁹⁰ The Act also states that researchers must use their judgement when deciding if something constitutes good or poor research practices, noting the law acknowledges the ambiguity and open-ended nature of 'good research practices'.⁹¹

⁸⁹ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

⁹⁰ Act on responsibility for good research practice and the examination of research misconduct (2019:504) [Internet]. UHR.se. [cited 2023 Feb 27]. Available from: <https://www.uhr.se/en/start/laws-and-regulations/Laws-and-regulations/act-on-responsibility-for-good-research-practice/>

⁹¹ Ibid.

The United Kingdom (UK)

Summary

The UK maintains a self-regulatory model.

The Concordat to Support Research Integrity (the Concordat) aims to provide a national framework for good research conduct and its governance. Signatories to the Concordat meet the five commitments described within the document through policy statements. Whilst private and public institutions are signatories to the Concordat, guidelines promulgated by the UK's research integrity bodies only apply to publicly funded researchers.⁹²

Research institutions are primarily responsible for maintaining good research practices and investigating allegations of research misconduct. The UK Committee on Research Integrity (UK CORI) was established in 2018 to promote, educate and advise on research integrity. It does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness.

A separate member organisation, the UK Research Integrity Organisation (UKRIO), is a non-government advisory body. The UKRIO provides independent and non-mandatory support, advice, and education to their members, and publishes best practice guidelines and resources. Research integrity arrangements are illustrated in Figure 22 and expanded on below.

Recent reviews and commentary on the UK's model can be found in Figure 25.^{93 94}

Figure 22. Research integrity arrangements in the UK (Source: KPMG).



Elements of the research integrity governance system

The Concordat

The Concordat is the UK's national policy statement on research integrity. The Concordat responds to recommendations set out in the UK Parliamentary Inquiry by the Science and Technology Committee (2011)⁹⁵ report on research integrity. There are five commitments within the Concordat that aim to support good research practice and a healthy research culture. Signatories to the Concordat are listed in Figure 23.

Figure 23. Signatories of the Concordat (Source: Universities UK).

Signatories of the Concordat

- Cancer Research UK.
- Department for the Economy, Northern Ireland.
- Higher Education Funding Council for Wales.
- National Institute for Health and Care Research.
- Scottish Funding Council.
- The British Academy.
- UK Research and Innovation.
- Wellcome Trust.
- GuildHE Research.

Signatories meet the requirements of the Concordat through policy documents, grant terms and conditions that stipulate guidance on good research practice, and the role of: funding agencies, research organisations and researchers in investigating allegations of misconduct.⁹⁶

⁹² The Concordat to Support Research Integrity [Internet]. Universities UK; Available from: <https://www.universitiesuk.ac.uk/sites/default/files/field/downloads/2021-08/Updated%20FINAL-the-concordat-to-support-research-integrity.pdf>

⁹³ Reproducibility and research integrity [Internet]. UK Parliament. [cited 2022 Dec 20]. Available from: <https://committees.parliament.uk/work/1433/reproducibility-and-research-integrity/>

⁹⁴ Research integrity: a landscape study — Vitae Website [Internet]. www.vitae.ac.uk. [cited 2023 Feb 27]. Available from: <https://www.vitae.ac.uk/vitae-publications/research-integrity-a-landscape-study>

⁹⁵ Reproducibility and research integrity [Internet]. UK Parliament. [cited 2022 Dec 20]. Available from: <https://committees.parliament.uk/work/1433/reproducibility-and-research-integrity/>

⁹⁶ Ibid.

Definition of research misconduct

The Concordat defines a breach of research integrity as: “Fabrication, falsification, plagiarism, a failure to meet legal, ethical and professional obligations, misrepresentation of data, authorship, interests, qualifications and publication history, and the improper dealings of allegations of misconduct such as attempting to cover-up allegations, and conducting retaliation against whistle-blowers”.⁹⁷

Role of signatories of the Concordat and funding agencies

All signatories have expressed their commitment to the Concordat. There is variation across signatory policies and governance documents to operationalise the five commitments. Signatories of the Concordat that are funding agencies of research may impose requirements on grantees, through grant funding terms and conditions.⁹⁸ As the largest public funder of research in the UK, the approach taken by the UKRI has been used as an example of how these expectations are met.⁹⁹

UK Research & Innovation (UKRI)

The UKRI is a non-departmental public body sponsored by the Department for Science, Innovation and Technology.¹⁰⁰ The UKRI was established in 2018 and delivers the majority of public funding for research and innovation in the UK. It brings together the seven disciplinary research councils, Research England and Innovate UK. The UKRI provides funding to researchers, businesses, universities, National Health Service (NHS) bodies, charities, non-governmental organisations (NGOs) and other institutions.¹⁰¹

The UKRI has published policy statements (listed in Figure 24) that describe how the principles within the Concordat should be applied. These policies detail the responsibilities of the UKRI, research organisations and individual researchers on the governance of good research practices and responding to allegations of research misconduct. These are part of the UKRI's grant standard terms and conditions.¹⁰² Definitions of research misconduct within these policies are aligned to the Concordat.

Figure 24. UKRI policy statements on research integrity to operationalise the Concordat (Source: KPMG).

UKRI policy statements on research integrity

- UKRI policy for investigating allegations of research misconduct in research policy.
- UKRI guidance for applicants on declaring interests.
- UKRI policy and guidance on the governance of good research practice.

Role of funding agencies and signatories to the Concordat in responding to allegations of research misconduct

Funding agencies do not investigate allegations of research misconduct. They do not act as appeal bodies, or provide expertise to organisations in conducting investigations, or advice to individuals involved in investigations. They may, however, take action against institutions and individual researchers who receive grant funding, in response to their failure to uphold research integrity and appropriately handle research misconduct. For example, see the UKRI grant terms and conditions, and the UKRI policy for investigating allegations of research misconduct in research.

Actions on research institutions

In response to systemic failure or oversight of research integrity and the handling of research misconduct, the UKRI may:

⁹⁷ Ibid.

⁹⁸ Ibid.

⁹⁹ Investigating Allegations of Misconduct in Research Policy v3.0 (UKRI [Internet]). UKRI; 2018 [cited 2023 Feb 12]. Available from: <https://www.ukri.org/wp-content/uploads/2020/10/UKRI-020920-InvestigatingAllegationsOfMisconductInResearchPolicy.pdf>

¹⁰⁰ Declaration of Interests: Applicants [Internet]. UKRI; [cited 2023 Feb 23]. Available from: <https://www.ukri.org/wp-content/uploads/2020/11/UKRI-261120-Declaration-of-Interests-for-applicants-v2.pdf>

¹⁰¹ Who we are – UKRI [Internet]. Available from: <https://www.ukri.org/about-us/who-we-are/>

¹⁰² UKRI policy on the governance of good research practice (GRP) [Internet]. UKRI; [cited 2023 Feb 23]. Available from: <https://www.ukri.org/publications/ukri-policy-on-the-governance-of-good-research-practice/>

- Educate and collaborate: use the UKRI funding assurance programme to improve policies and practices in collaboration with the organisation.
- Apply sanctions and penalties: suspending a grant(s), restricting applications for specific grants, suspending the UKRI payments to the institution, or terminating a grant if no remedial action plan can be identified to mitigate the risks.

Actions on researchers

In instances where an allegation of research misconduct against a researcher is partially or wholly upheld following an investigation by the research institution, the UKRI may:

- Reject any application, require further oversight of funded research, require the individual be removed from funding, or terminate a funded project in more serious cases.
- Prevent the submission of further applications to the UKRI or prevent the individual from acting as an expert reviewer or member of an advisory committee.
- Reclaim unspent money awarded by the UKRI to the organisation for projects involving that individual.

Each year, the UKRI publishes select details of all cases of research misconduct that institutions in receipt of UKRI funding investigate.

Figure 25. Reviews and commentary into the UK's research integrity arrangements (Source: KPMG).

Reviews and commentary

Parliamentary Inquiry: Reproducibility and research integrity (July 2021 – ongoing)

With rising interest and concerns with reproducibility and integrity, the UK Parliament Science and Technology Committee launched a Parliamentary Inquiry to gain a deeper understanding of research integrity.⁹³

Research integrity: a landscape study (June 2020)

This report was commissioned by the UKRI and suggests the following:

- There is scope for government and funders to integrate research integrity into policies more effectively.
- The research integrity system is largely a system based on trust.
- Policies and processes should be reviewed to ensure they incentivise research integrity.
- Smaller communities such as research groups, departments or discipline levels are 'strong bonds' and can be resistant to forces' such as institutional, national and international policies.⁹⁴

Research institutions

It is the responsibility of the employing research organisation to support and demonstrate they meet and promote the standards of research integrity. Research institutions that receive funding through a Concordat signatory are expected to have in-place systems to promote best practice, and a positive research culture that supports open discussion around research integrity issues.

Role of research institutions in responding to allegations of research misconduct

Investigation procedures within research institutions should be consistent with policy statements, and grant terms and conditions stipulated by the funding agency. The UKRI policy statements include the use of independent external members on the panel at the formal investigation stage. The UKRI may wish to seek observer status on formal investigations by exception. This may occur if there has been a pattern of issues at the investigating organisation, or if there are implications for the reputation of the UKRI.

UK CORI

The UK CORI is an independent committee, hosted by the UKRI for three years (formed in 2022). The UKRI is the sponsor and funder of the UK CORI, providing secretariat and resource support for the committee. The UK CORI is advisory only, and it does not have powers to investigate and handle complaints regarding specific misconduct or procedural fairness. Research institutions have the responsibility for investigating and imposing sanctions.¹⁰³

¹⁰³ How we help - UK Research Integrity Office [Internet]. [cited 2023 Feb 27]. Available from: <https://ukrio.org/our-work/>

The UK CORI has formal responsibility for promoting research integrity across the UK, as well as building consensus and co-ownership across the system.¹⁰⁴ The principles and definitions of research integrity used to frame the work of the UK CORI are taken from the Concordat.

UKRIO

The UKRIO is an advisory body and has no formal role as a regulator of research integrity among research institutions. The UKRIO can provide guidance and advice in some instances, at the request of institutions/employers/subscribers.¹⁰⁵ Individuals and organisations pay a subscription fee to receive UKRIO advice and guidance. It is based on, and aims to reinforce, best professional practice in the conduct of research and in addressing questionable behaviour and misconduct.¹⁰⁶ Elements of the UKRIO's work programme include:

- Provide independent, expert and confidential advice on the conduct of academic, scientific and medical research, from promoting good practice to addressing poor practice and misconduct.
- Publish guidance on research integrity and good research practices.
- Education, training and development activities for research integrity and related fields.
- Expert involvement in investigations of allegations of research misconduct.
- Inform development of national policies.

The UKRIO covers all research sectors: higher education, the NHS, private sector organisations and charities.

¹⁰⁴ UK Committee on Research Integrity Terms of Reference [Internet]. UK Committee on Research Integrity. 2022 Oct [cited 2022 Dec 20]. Available from: <https://www.ukri.org/wp-content/uploads/2022/06/UKRI-311022-TermsOfReference-UK-CommitteeOnResearchIntegrity.pdf>

¹⁰⁵ Get advice from UKRIO - UK Research Integrity Office [Internet]. [cited 2023 Mar 21]. Available from: <https://ukrio.org/our-work/get-advice-from-ukrio/>

¹⁰⁶ How we help - UK Research Integrity Office [Internet]. [cited 2023 Feb 27]. Available from: <https://ukrio.org/our-work/>

The United States of America (USA)

Summary

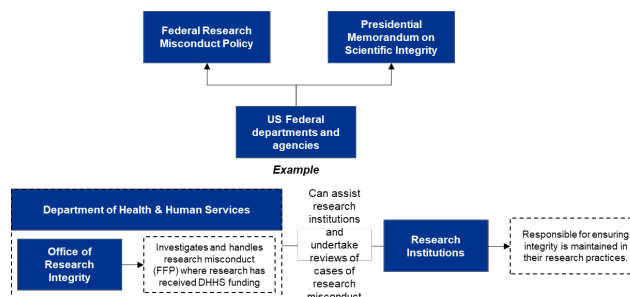
The US maintains a national governance model with national legislation and delegate decision-making powers. There are two key policies that outline how research integrity is maintained in the US. These are: the Federal Research Misconduct Policy and the Presidential Memorandum on Scientific Integrity. Both policies are only applied to Government funded research.

The Federal Research Misconduct Policy (the Policy) outlines the responsibilities of federal agencies and research institutions in handling allegations of research misconduct. All federal agencies and departments were required to implement the Policy.¹⁰⁷ Twenty-four federal government departments and agencies have adopted scientific integrity policies that are consistent with the Presidential Memorandum on Scientific Integrity (the Presidential Memorandum), and the subsequent Memorandum to the Heads of Departments and Agencies (the Memorandum).¹⁰⁸

The US Department of Health & Human Services (HHS) also established an Office of Research Integrity (ORI) that is responsible for maintaining research integrity relevant to Public Health Service (PHS) research. Whilst research institutions are responsible for ensuring integrity is maintained in their research practices, the ORI can assist institutions and can undertake reviews of cases of research misconduct.

Research integrity arrangements are illustrated in Figure 26. Recent reviews and commentary on the US model can be found in Figure 28.^{109 110}

Figure 26. Research integrity arrangements in the USA (Source: KPMG).



National policy statements on research integrity

Federal Research Misconduct Policy

Developed by the Office of Science and Technology, this policy governs all federal funding agencies. It applies to all research conducted by Federal agencies, by contractors on behalf of the Federal government, or by third parties such as research institutions that are supported by Federal agencies. Figure 27 lists the responsibilities of federal agencies to investigate allegations of research misconduct, documented within the Federal Research Misconduct Policy.¹¹¹ This policy ensures that all federal funding agencies have clear guidelines that outlines their responsibilities in investigating allegations of research misconduct.

¹⁰⁷ Federal Policies | ORI - The Office of Research Integrity [Internet]. [cited 2023 Feb 27]. Available from: <https://ori.hhs.gov/federal-policies>

¹⁰⁸ Scientific Integrity [Internet]. The White House. [cited 2023 Feb 27]. Available from: <https://obamawhitehouse.archives.gov/administration/eop/ostp/library/scientificintegrity>

¹⁰⁹ U.S. report calls for research integrity board [Internet]. www.science.org. Available from: <https://www.science.org/content/article/us-report-calls-research-integrity-board>

¹¹⁰ Enhancing the Security and Integrity of America's Research Enterprise [Internet]. The White House. [cited 2022 Dec 20]. Available from: <https://www.whitehouse.gov/ostp/>

¹¹¹ Federal Research Misconduct Policy | ORI - The Office of Research Integrity [Internet]. ori.hhs.gov. Available from: <https://ori.hhs.gov/federal-research-misconduct-policy>

Definition of research misconduct

The Federal Research Misconduct Policy defines a breach on research integrity, as “fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results”.¹¹²

The Presidential Memorandum on Scientific Integrity

The Presidential Memorandum on Scientific Integrity outlines six principles of scientific integrity. From this, the Director of the Office of Science and Technology Policy was requested to create a subsequent Memorandum.¹¹³ The purpose of this document was to provide implementation guidance on US federal government policies pertaining to scientific integrity. Twenty-four federal government departments and agencies have implemented policies outlined in the Memorandum.

Figure 27. Research integrity arrangements in the US (Source: The Federal Research Misconduct Policy).

The Federal Policy inquiry and investigation procedures for allegations of research misconduct

The Federal Policy specifies that any allegation of research misconduct, which are the responsibility of each institution, will usually consist of several phases, including:

- An inquiry: the assessment of whether the *allegation* has substance and if an investigation is warranted;
- An investigation: the formal development of a factual record, and the examination of that record leading to dismissal of the case or to a recommendation for a finding of research misconduct or other appropriate remedies;
- Adjudication: during which recommendations are reviewed and appropriate corrective actions determined.

Government funding agencies of research

Department of Health & Human Services (HHS)

The HHS, through the PHS, is the world’s largest public funder of biomedical research. The HHS, administered through the PHS, provides approximately US \$38 billion towards health research and development.¹¹⁴ The approach taken by the DHHS to meet responsibilities described in the Federal Research Misconduct Policy have been used in this case study as an example. The PHS grants funding to research institutions and research conducted in Federal government facilities.

Examples of how the HHS implemented the Federal Research Misconduct Policy include:

- The HHS now requires institutions to provide the respondent with the draft investigation report, as well as access to the evidence found within the report.
- Separating the investigation and adjudication process by ensuring the ORI is responsible for making any findings throughout its review of institutional processes and findings.

The ORI

The ORI is responsible for research integrity activities that fall under the DHHS. Whilst there are other Government agencies that handle research integrity, the ORI has been included as an example due to its substantial framework.

Figure 28. Reviews and commentary (Source: KPMG).

Reviews and Commentary

U.S. report calls for research integrity board (2017, article in Science)

The National Academies of Sciences, Engineering, and Medicine released a report calling on universities and scientific societies to create, operate, and fund a new, independent, nongovernmental Research Integrity Advisory Board (RIAB). Other organisations investigate breaches, but none have research integrity as their sole focus.¹⁰⁹

Enhancing the Security and Integrity of America’s Research Enterprise (2020)

The White House Office of Science and Technology Policy released a presentation that outlines core principles and values of research integrity, the shared responsibilities of all research actors in upholding research integrity and risks to research integrity.¹¹⁰

¹¹² Scientific Integrity: Fuelling Innovation, Building Public Trust [Internet]. whitehouse.gov. 2010 [cited 2023 Feb 27]. Available from: <https://obamawhitehouse.archives.gov/blog/2010/12/17/scientific-integrity-fueling-innovation-building-public-trust-ostp>

¹¹³ Ibid.

¹¹⁴ About ORI | ORI - The Office of Research Integrity [Internet]. ori.hhs.gov. Available from: <https://ori.hhs.gov/about-ori>

The ORI assists institutions who are addressing allegations of research misconduct, reviews research misconduct reports created by research institutions and delivers its own findings, and creates policies, processes and regulations for research integrity.

Responding to allegations of research misconduct

Research institutions that received HHS funding are required to conduct initial inquiries, and investigations into allegations of research misconduct. The role of the ORI in responding to allegations of research misconduct includes:

- Providing assistance to institutions (if required) as they conduct investigations.
- Review the institutions investigation findings and record its own independent outcome.
- If warranted, the ORI may conduct a review of the preliminary investigation, which can amount to a re-investigation of the allegation.

If the ORI finds that research misconduct has taken place, the HHS can impose administrative actions. As ORI findings are independent of the institution's findings, if the ORI does not consider misconduct to have taken place, this does not negate the findings of the institution.¹¹⁵

Research institutions

In accordance with the Federal Research Misconduct Policy, the administration of research integrity and misconduct is the responsibility of the individual institution. To receive funding from the HHS, (administered via the PHS), research institutions must adhere to the PHS' Policies on Research Misconduct. Some of these responsibilities include:

- Institutions must ensure there are written policies and processes in-place that address allegations of research misconduct.
- File an Assurance of Compliance with the ORI.
- Take steps to grow and maintain research integrity within their institutions.

Research institutions are also made aware of the role the ORI plays within handling allegations of research misconduct. Research institutions' obligations to the ORI include:

- Provide an Annual Report on Possible Research Misconduct
- Engaging with the ORI as they investigate allegations of misconduct.
- Ensure compliance with ORI policies.

It is the responsibility of research institutions to ensure they are maintaining research integrity amongst their personnel, and within all publicly funded research projects.¹¹⁶

¹¹⁵ Frequently Asked Questions | ORI - The Office of Research Integrity [Internet]. ori.hhs.gov. Available from: <https://ori.hhs.gov/frequently-asked-questions#7>

¹¹⁶ Assurance Program | ORI - The Office of Research Integrity [Internet]. Available from: <https://ori.hhs.gov/assurance-program>

Diversity and trends in research integrity governance arrangements internationally

This section discusses:

- The different models for managing research integrity in the nine jurisdictions included in this Report;
- The drivers for the establishment and reform of research integrity arrangements; and
- Elements of these arrangements that are essential to their effectiveness.

The observations in this section are informed by analysis of these different research integrity governance arrangements mapped in the comparison table and individual country case studies.

Models of research integrity arrangements

Research integrity governance approaches and systems adopted internationally are heterogenous.¹¹⁷ Three common research integrity governance models have emerged across the nine countries explored in this Report. They can be classified into: national governance, national oversight, and self-regulation. The arrangement adopted in each jurisdiction involves a trade-off between prescriptive standards and expectations that must be followed, and standards and expectations that allow more flexibility and internal oversight than enforced compliance obligations.

The different models exist on a continuum and are characterised by the presence of legislation, establishment of a central body and the responsibilities and functions afforded to the central body.

The local adoption of these characteristics may be different in countries where the overarching approach to research integrity governance arrangements are within the same category.

Across all three models, the primary responsibility for investigating breaches of research integrity resides with the research institution. In systems where independent bodies have been established with investigatory powers (e.g. a national governance model), investigations are normally done only by request from a particular institution.

Attributes of a national governance approach to research integrity governance

A national governance approach is characterised by a system that is established in national legislation and is governed by a central body or authority. Across the countries included in this report with a national governance model, the legislation and supplementary policy documents define 'serious misconduct' as FFP. There is a **separation of responsibilities** between the central body, which is to investigate cases of potential serious misconduct, and research institutions, which are responsible for establishing procedures and policies to address potential breaches of other types of research misconduct. The system distributes duties by providing such definitions and procedural requirements in legislation that set limits for responsibilities based on clear description of types of research misconduct. The legislative basis provides powers at a national level for management of cases of 'serious misconduct' for research undertaken within certain conditions – primarily funding arrangements – and sets directives for research institutions in monitoring and managing research misconduct that falls outside this narrow scope.

¹¹⁷ Anderson MS. Global Research Integrity in Relation to the United States' Research-Integrity Infrastructure. Accountability in Research. 2014;21(1):1-8. DOI: 10.1080/08989621.2013.822262

A national governance approach includes policy instruments (e.g. codes or guidelines) that researchers and institutions are required to adhere to when undertaking research activities. Maintaining responsible research practices is the primary responsibility of researchers and institutions, which allows for flexibility between discipline and locality related norms.

The three countries reviewed in this report which demonstrate a national governance approach to research integrity all have national legislation and delegated decision-making powers. In Denmark and Sweden, the respective central bodies have the primary responsibility for investigating allegations of FFP. Research institutions undertake the preliminary investigation of all other allegations of research misconduct including QRP. In the US, the research institutions are responsible for the preliminary investigation of FFP. The respective independent office (for example, the ORI for DHHS funded research), reviews the outcome of this investigation, and may also carry out an assessment.

Across all three countries, research institutions are expected to: promote good research culture and practice (e.g. through awareness and education efforts), and self-govern investigations into all other breaches of research misconduct.¹¹⁸ In this way, institutions are empowered to take accountability for fostering good practices and norms at the research level.

Attributes of a national oversight approach to research integrity governance

National oversight systems are non-legislated. A national oversight approach is typified by **limits on investigatory powers** outside of research institutions and only examines the processes undertaken by an institution when handling allegations of research misconduct, or assess serious breaches by an institution itself. The model involves a central body, but unlike one that is established by legislation, this type of central body provides more of an oversight or advisory role. Countries which adopt this type of approach to research integrity arrangements implement nationally consistent concepts of research integrity and direct how institutions should operationalise these functions. These may be documented in national guidelines, codes of conduct or policies overseen by a granting council or national research integrity body. The research sector is then expected to interpret and adopt these policies and principles within their own institutional policies and procedures governing research misconduct.

Research institutions carry **primary responsibility for initial investigations** into the merit of research misconduct and questionable research practices. There is variability in the type, degree of independence and authority given to the national oversight body. For example, in Canada, research institutions have specific obligations (attached to funding agreements) to regularly report detailed information about the merit, and process of each investigation. The national oversight body validates compliance with institutional policies and procedures. In Japan, the central body has responsibility for monitoring the performance of research institutions with regards to research integrity functions. Regular surveys of institutions are carried out, which can lead to substantial financial penalties should they be found to not meet their obligations. This review and advisory role of central bodies provides a mechanism to ensure that principles are upheld, procedural fairness is preserved, and institutions are fulfilling their obligations.¹¹⁹ This aims to reduce the administrative burden and minimise potential duplication of some functions.

Attributes of a self-regulation approach to research integrity governance

A self-regulated approach to research integrity governance is characterised by a decentralised authority governing to a set of principles agreed to by a membership of institutions. While being the 'least regulated' of the approaches, the principles and/or policies are usually underpinned by requirements (at various levels of detail) in grant funding agreements. The defining elements create a *research culture* approach where the seriousness of breaches does not determine governance arrangements; in this way, both research misconduct and questionable research practices are the full responsibility of researchers and institutions.¹²⁰

¹¹⁸ Department for Business, Energy & Industrial Strategy and UK Research and Innovation. (2022). Independent review of research bureaucracy: final report. Published 2022 July. <https://www.gov.uk/government/publications/review-of-research-bureaucracy> Accessed 5 Dec. 2022

¹¹⁹ Ibid.

¹²⁰ Douglas-Jones R, Wright S. Mapping the Integrity Landscape: Organisations, Policies, Concepts. CHEF, Danish School of Education, Aarhus University. 2017, p. 1-35
https://pure.itu.dk/files/82382941/Working_Paper_27_Mapping_the_Integrity_Landscape.pdf Accessed 2022 Dec. 1

This approach seeks to coordinate national policies, codes, and guidelines without imposing a significant bureaucratic burden or prescriptive requirements on researchers and institutions. More formal arrangements are managed by a coordinating national body whereas other systems utilise professional networks or learned societies. Matters of process, responsibilities, culture, and best practice are described in national guiding documents (which may include policies or frameworks and are also reflected in grant funding agreements). These may be translated and implemented locally, within a research institution.¹²¹ These systems promote local leadership, visibility of issues at the local level, and ownership of implementation for appropriate actions.¹²²

¹²¹ Davies SR & Lindvig K. (2021) Assembling research integrity: negotiating a policy object in scientific governance, *Critical Policy Studies*, 15:4, 444-461, DOI: 10.1080/19460171.2021.1879660

¹²² ESF (2010) *Fostering Research Integrity in Europe. A Report by the ESF Member Organisation Forum on Research Integrity*. Strasbourg: European Science Foundation. <http://archives.esf.org/coordinating-research/mo-fora/research-integrity.html> Accessed 15 Dec. 2022

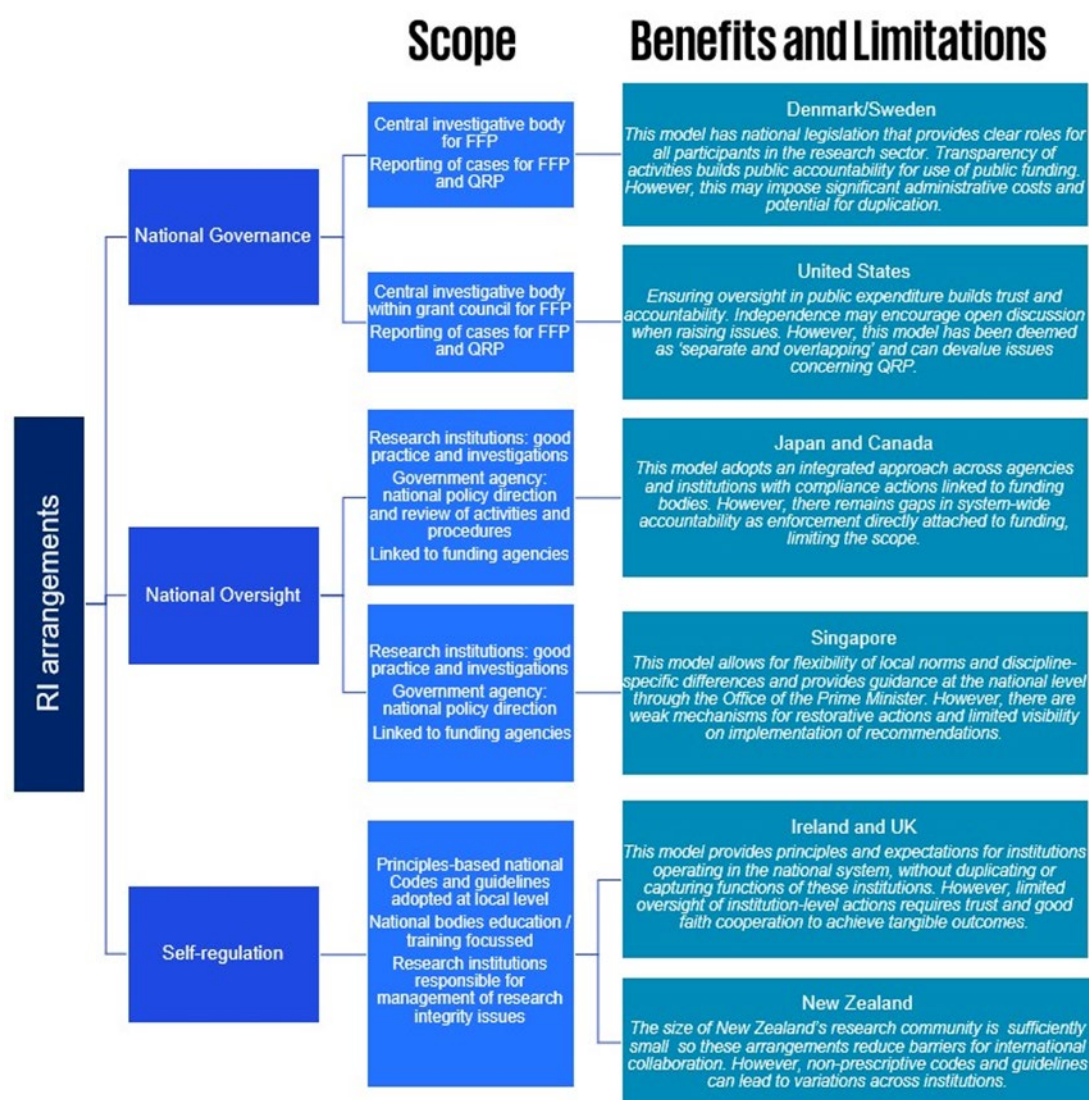


Figure 29. Benefits and limitations of different research integrity governance models (per insights from international case studies).

What elements within a model are important?

Key elements emerged across the selected country case studies which provides an informative summary of research integrity arrangements. Figure 30 summarises these findings, which are expanded in this section. The differences revealed in the case studies are indicative of the heterogenous nature of research norms and country-specific conditions. This is highlighted in the governance arrangements present in each country to support responsible conduct of research. All countries have an emphasis on empowering researchers to promote and maintain a good research culture. Arrangements can be challenging to compare where there is limited data on appropriate metrics and indicators to measure the success of governance arrangements.¹²³ As Figure 29 outlines, the variety and flexibility within many of these models reflects the difficulty in dictating norms where local differences in organisational culture and discipline related variances exist (protocols, methodologies, rules).¹²⁴

¹²³ Horbach, S.P.J.M., Breit, E., Halfman, W. et al. On the Willingness to Report and the Consequences of Reporting Research Misconduct: The Role of Power Relations. *Sci Eng Ethics* 26, 1595–1623. 2020. <https://doi.org/10.1007/s11948-020-00202-8>

¹²⁴ Ibid.

Benefits and limitations of a national governance approach to research integrity governance

Jurisdictions with legal frameworks which establish a central authority to manage research integrity also develop strong principles-based policies. An outcome achieved through this model is increased transparency of research practices at the local level, whilst poor processes are discouraged. This is facilitated through the following characteristics present in a national governance approach:

- Clearly delineated roles and responsibilities which prioritise fairness and credibility.
- Increased safeguards for public accountability

The separation of functions is beneficial to building confidence for open discourse where individuals are more likely to feel comfortable reporting poor behaviour to a separate organisation regarding a colleague, supervisor, or institutions.^{125 126} The inclusion of more detailed definition of types of research misconduct as well as ethical values linked to good practice are important to establishing fairness and credibility.¹²⁷

Denmark and Sweden established statutory bodies, alongside laws that provide definitions for research misconduct (which is limited to FFP) and other deviations (QRP). The role of the statutory body is to explicitly investigate cases of FFP that are raised or referred to the body. Sweden has an escalation system in-place requires research institutions have a primary investigator role for FFP, as well as sole responsibility to manage cases of QRP.¹²⁸ Laws in both countries state that institutions must establish transparent policies, procedures and guidelines for operating these functions at the local level.

In the US, the granting councils have oversight offices that ensure researchers and research institutions adhere to responsibilities. These conditions are linked to public funding relationships.¹²⁹ The offices have similar functions in collating data on investigations of research misconduct and assessing research institution reports for cases managed through institution procedures and arrangements. While some granting councils have greater delegated responsibilities to investigate allegations of FFP, ORI (within DHHS) will only review investigations if referred after a research institution has responded to potential breaches in the first instance.¹³⁰ Other forms of poor research practices and misconduct are the primary responsibility of the research institutions with mandatory reporting of cases, outcomes, and penalties, where relevant. These mechanisms ensure public accountability is embedded in the system and public trust continues to be built.

Benefits and limitations of a national oversight approach to research integrity governance

A national oversight model encourages an integrated approach across agencies for the management of research integrity. Jurisdictions that opt for a national oversight model experience greater flexibility in their research integrity arrangements, which allows for norms and discipline-specific differences to be considered when managing cases of potential breaches.¹³¹ The administrative burden and duplication of functions that can be present within a national governance approach (i.e., with formal legal status and powers), is often avoided or minimised within the national oversight model.¹³² This is due to the oversight mechanism reviewing the research institution reports into investigations, rather than conducting subsequent inquiries.

The models adopted in Japan and Canada have authority to administer research integrity arrangements through their ability to manage funding arrangements, coordinate initiatives for

¹²⁵ Else H. Swedish research misconduct agency swamped with cases in first year. *Nature*. 2021 Sep 13;597(7877):461–1

¹²⁶ Horbach, S.P.J.M., Breit, E., Halfman, W. et al. On the Willingness to Report and the Consequences of Reporting Research Misconduct: The Role of Power Relations. *Sci Eng Ethics* 26, 1595–1623. 2020. <https://doi.org/10.1007/s11948-020-00202-8>

¹²⁷ Desmond H, Dierckx K. Research integrity codes of conduct in Europe: Understanding the divergences. *Bioethics*. 2021;00:1–15. <https://doi.org/10.1111/bioe.12851>

¹²⁸ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6.

¹²⁹ Resnik DB, Master Z. Policies and Initiatives Aimed at Addressing Research Misconduct in High-Income Countries. *PLoS Med* 10(3): e1001406.2013. doi:10.1371/journal.pmed.1001406

¹³⁰ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

¹³¹ Sørensen, M.P., Ravn, T., Marušić, A. et al. Strengthening research integrity: which topic areas should organisations focus on? *Humanit Soc Sci Commun* 8, 198. 2021. <https://doi.org/10.1057/s41599-021-00874-y>

¹³² Ibid.

promotion of good research practices, and provide attestation¹³³ functions.^{70 134} As a non-legislated model led by the granting councils, Canada's system allows research institutions autonomy to tailor governance processes and procedures to their environment and needs (i.e., size of institution, speciality disciplines).¹³⁵

Japan's research integrity policies are driven by the Cabinet Office with dedicated resources in MEXT. Oversight activities carried out by MEXT are wide ranging from systematic audits of research institutions' procedures and outcomes for investigations, compliance with education and training requirements, to coordination with funding agencies to ensure they are fulfilling their own requirements for research integrity.¹³⁶

The self-regulated model (with national oversight) allows the flexibility for institutions to improve or change these mechanisms to suit the needs of their researchers, and broader organisation, as norms evolve or needs change over time.

Benefits and limitations of a self-regulated approach to research integrity governance

A self-regulated model is reliant on a strong *research culture*, where both research misconduct and questionable research practices are handled by researchers and institutions, albeit with some degree of underpinning provided through the provisions of funding agreements.

In the UK and Ireland there has been greater focus on education, outreach and the promotion of good research practice. A key objective in these jurisdictions is to commit resources that promote good research practices through education and training opportunities.¹³⁷ Stakeholders within the research sector are provided with central communication channels to harmonise knowledge sharing. However, as this system involves limited oversight, it relies on a system of shared trust and good faith to ensure research integrity is maintained.⁶ Cases of high-profile misconduct have a high risk of potentially eroding this sense of shared trust, causing damage to a key pillar of this system.¹³⁸

In countries such as New Zealand, local engagement and communication channels are sufficient to monitor poor practices due to the size of the research sector, rather than supporting a stand-alone government directed organisation. Under these conditions the research community is a much smaller network resulting in reputational effects being an efficient deterrent to engaging in poor research behaviours.¹³⁹ Regulatory actions and prescriptive approaches impose high costs¹⁴⁰ that may not be sustainable or represent a justifiable cost-benefit equation for sectors of this size. It is also an advantage in countries such as New Zealand where international collaboration is promoted to enhance local output and productivity.¹⁴¹ A limitation of this system is the application of research

¹³³ Note: attestation functions involve activities such as collating reports from institutions and agencies on responses to allegations of research misconduct, reporting to responsible Ministries on research integrity activities, or auditing reports from institutions on procedures to ensure they meet their obligations to receive public funding

¹³⁴ European Molecular Biology Organisation (EMBO). Governance of research integrity: Options for a coordinated approach in Europe. 2020. Heidelberg. https://www.embo.org/documents/science_policy/governance_of_ri.pdf

¹³⁵ Honesty, Accountability and Trust: Fostering Research Integrity in Canada [Internet]. Council of Canadian Academies. 2020 Oct [cited 2022 Dec 20]. Available from: <https://cca-reports.ca/reports/honesty-accountability-and-trust-fostering-research-integrity-in-canada/>

¹³⁶ Suzuki K. Understanding Japan's Approach to Economic Security. Stimson [Internet]. 2023 Feb 10 [cited 2023 Feb 23]. Available from: <https://www.stimson.org/2023/understanding-japans-approach-to-economic-security/>

¹³⁷ UK CORI. UK Committee on Research Integrity 2023-2025 strategic plan [Internet]. 2023 Feb 23 [cited 2023 Feb 27]. Available from: <https://ukcori.org/wp-content/uploads/2023/02/UK-Committee-on-Research-Integrity-Strategic-Plan.pdf>

¹³⁸ National Academies of Sciences, Engineering, and Medicine; Policy and Global Affairs; Committee on Science, Engineering, Medicine, and Public Policy; Committee on Responsible Science. Fostering Integrity in Research. Washington (DC): National Academies Press (US); 2017 Apr 11. 4, Context and Definitions. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK475954/>

¹³⁹ Gunsalus CK, Marcus AR, Oransky I, Stern JM. Institutional and individual factors that promote research integrity. In: Macrina FL, editor. Scientific Integrity: Text and Cases in Responsible Conduct of Research. 4th ed. Washington, DC: ASM Press; 2018. p. 53-82

¹⁴⁰ Responsible Science: Ensuring the Integrity of the Research Process: Volume I. Washington, DC: The National Academies Press. <https://doi.org/10.17226/1864> and Michalek AM, Hutson AD, Wicher CP, Trump DL. The costs and underappreciated consequences of research misconduct: a case study. PLoS Med. 2010;7(8):e1000318. Published 2010 Aug 17. doi:10.1371/journal.pmed.1000318

¹⁴¹ Consistent with Government policy statements across sector. For an example of this, see: Ministry of Business, Innovation and Employment. New Zealand's high speed research network: at a critical juncture. Sapere Research Group: Wellington. 2018. Available from: <https://www.srgexpert.com/wp-content/uploads/2019/04/New-Zealand%E2%80%99s-high-speed-research-network-at-a-critical-juncture.pdf>

integrity processes varies across institutions, potentially resulting in various approaches and inconsistencies throughout the research sector.

Elements of effective research integrity arrangements

The literature suggests there is no one model or approach adopted internationally that is clearly more effective than others to maintain robust research integrity.¹⁴² There are three core elements within all governance models described, that are present for the chosen research integrity arrangement to operate effectively within each country. These elements are described below.

- **Policy:** Guiding frameworks, codes, regulations, rules, laws, and related statements at the national and institutional levels. Research universities' policies, procedures, and codes of ethics are more detailed than national statements, however the content is typically aligned.¹⁴³
- **Oversight:** Compliance and reporting obligations from researchers and institutions to national bodies. The depth and requirements of these are closely related to the policy frameworks in-place.¹⁴⁴
- **Education:** Online education modules, mentorship and on-the-ground learning driven largely at the institution level. Training and education activities generally include both the minimum standards and requirements articulated in national policy and/or legislation and expectations and norms of the institution, or research discipline. The content and depth of training provided is related to the nature of the overarching policy and legislation frameworks. In more regulated systems, training is needed to ensure researchers are aware of the compliance and reporting obligations, in other jurisdictions the purpose of this element is to raise awareness, guide behaviour and empower individuals to act when and if a breach or suspected breach occurs.¹⁴⁵

Each country adapts these to suit the size and maturity of the research sector, past breaches of misconduct and national government and bureaucratic arrangements. The socio-cultural environment will also affect how frameworks are accepted and adhered to. Countries with inclinations for greater government controls and interventions will be more likely to comply with directives and instruments. Similarly, regulatory activities and compliance functions are more readily accepted in countries with sufficient resources to bear the costs of these functions.

¹⁴² Horbach SPJM, Bouter LM, Gaskell G, Hiney M, Kavouras P, Mejlgaard N, et al. Designing and implementing a research integrity promotion plan: Recommendations for research funders. PLoS Biol 20(8): e3001773. 2022. <https://doi.org/10.1371/journal.pbio.3001773>

¹⁴³ Anderson MS. Global Research Integrity in Relation to the United States' Research Integrity Infrastructure. Accountability in Research (2013). Available from: <http://dx.doi.org/10.1080/08989621.2013.822262>

¹⁴⁴ Ibid.

¹⁴⁵ Ibid.

Conclusions

This Report reviewed common models and structures of research integrity governance approaches across nine countries to compare the drivers, system enablers, challenges and other contextual factors associated with preventing and governing breaches of research integrity.

The scope and distribution of responsibilities within each system are diverse and are indicative of the dynamic nature of research. Types of research integrity arrangements can be grouped into national governance, national oversight and self-regulation.

The literature suggests that no one model or approach analysed from these nine countries is able to be judged as demonstrably more effective from the available information. However, the literature does suggest there are three common features in the jurisdictions reviewed in this Report that support robust research integrity governance arrangements: These elements include a combination of:

- A national policy and/or legislation framework.
- Sector-adopted processes and instructions that align with national policy.
- An oversight mechanism.

Each country adapts these to suit the size and maturity of the research sector, past breaches of misconduct and national government and bureaucratic arrangements. The socio-cultural environment will also affect how frameworks are accepted and adhered to.

Appendix A: Drivers of different research integrity models

There are commonalities between the drivers to establish an approach to research integrity or drive reform within existing arrangements. The common drivers identified in the countries included in this Report include:

- High-profile cases of research misconduct.
- High prevalence or incidence of research misconduct.
- National security concerns regarding research integrity.
- Efforts to harmonise research integrity arrangements, and;
- Interest in research integrity to attract research investment.

It is notable that the research integrity governance approaches adopted in response to these triggering events differ from country to country. The literature suggests that other factors also influence local responses to these drivers for research integrity governance arrangements, including:

- Local cultural risk and regulatory appetite.
- Proximity to other countries.
- Size of country's research sector.
- Internationalisation of research and collaboration preferences.
- Existing research architecture and maturity of sector.

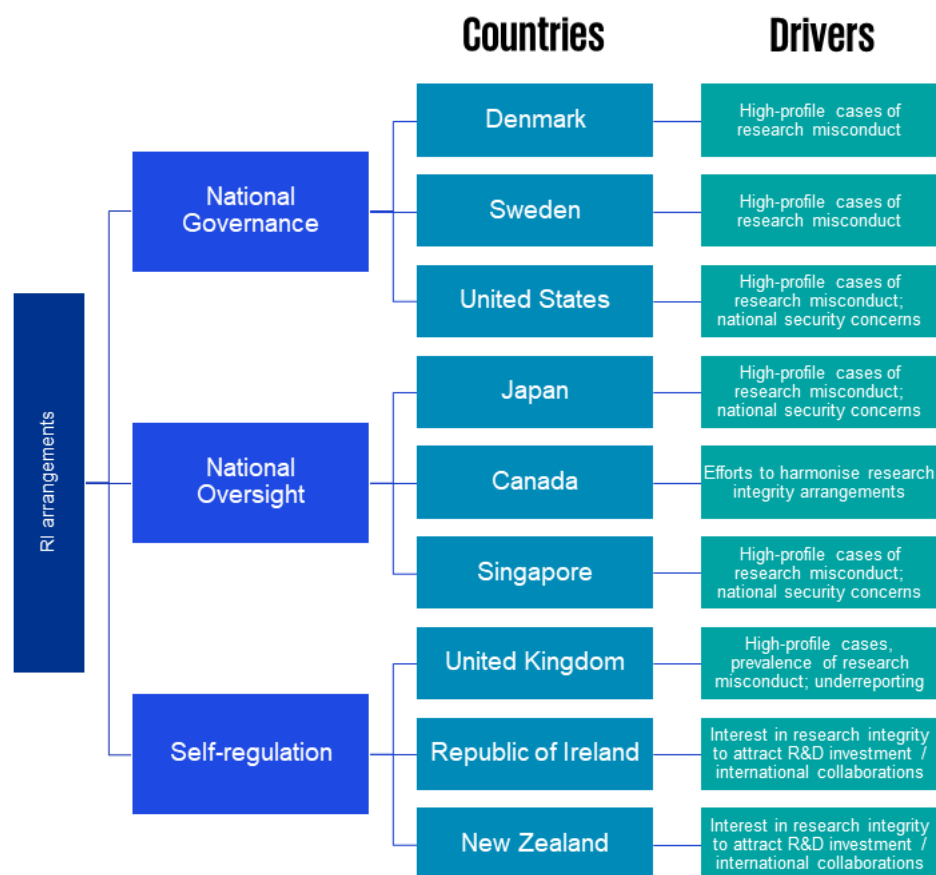


Figure 30. Drivers of different research integrity governance models (per insights from international case studies).

Responses to high-profile cases of research misconduct

High-profile cases of research misconduct are the most common catalyst for reshaping national research integrity systems. As reflected in Figure 30, this has been observed as a driver for research integrity governance arrangements in: Denmark, Sweden, the US, Japan and Singapore.

Responses to high prevalence or incidence of research misconduct

Monitoring the incidence and prevalence of research integrity breaches at a national level is challenging. There are limited reporting mechanisms in-place to capture cases of QRP as well as breaches of misconduct.¹⁴⁶ Although more egregious cases of misconduct attract public attention, such events are infrequent compared to the overall volume of research outputs. There has been a shift in recent years to collect data and report against broader forms of research misconduct outside of FFP.¹⁴⁷ Greater transparency facilitates better decision-making for all stakeholders in the research sector and interventions can be evaluated. The UK is currently implementing initiatives to improve research integrity arrangements due to the heightened awareness of this problem and failure of institutions to meet reporting commitments agreed to under the Concordat (see Figure 30).^{148 149}

The expansion of the research sector has required increased coordination to ensure core principles of integrity are upheld in all contexts. This is the case in Canada (see Figure 30) where the three main funding agencies created an intra-agency panel to ensure consistent practices and application of

¹⁴⁶ Vie KJ. Empowering the Research Community to Investigate Misconduct and Promote Research Integrity and Ethics: New Regulation in Scandinavia. *Sci Eng Ethics*. 2022;28(6):59. Published 2022 Nov 17. doi:10.1007/s11948-022-00400-6

¹⁴⁷ Ibid.

¹⁴⁸ Research integrity: UK guidelines are updated to ensure misconduct reporting. *BMJ* 2019;367: l6320 <https://doi.org/10.1136/bmj.l6320> Published 31 October 2019

¹⁴⁹ See: UK Science and Technology Committee. Reproducibility and research integrity inquiry. <https://committees.parliament.uk/work/1433/reproducibility-and-research-integrity/>

directions to remove barriers where there is overlap in funding. This arrangement is described in more detail in the country case studies.

Interest in research integrity as a means of growing research investment

The global nature of research highlights the competitive environment for governments to attract investment in research and development. The benefits are system-wide, independent of whether certain fields or disciplines are targeted in investment strategies. In 2015, Ireland (see Figure 30) developed a national strategy, Innovation 2020, to drive economic activity and achieve a vision to become a 'Global Innovation Leader'.¹⁵⁰ One of the key mission statements was to build: "An internationally competitive research system that acts as a magnet and catalyst for talent and industry". Achieving this goal included implementation of strong governance arrangements for research integrity.

Clearly defined responsibilities plus fair and transparent processes increase confidence in the ability of research integrity systems to control for unwanted and costly behaviours.¹⁵¹ Providing these robust structures leads to a reduction in sovereign risk and improves investor confidence, as well as ensuring continued public investment in research.¹⁵² ¹⁵³ The overall effect is positive influence on return-on-investment estimates, increased foreign investment, benefits to international reputation and greater activity in national productivity drivers.¹⁵⁴

¹⁵⁰ Innovation 2020 [Internet]. www.gov.ie. Available from: <https://www.gov.ie/en/publication/7287b-innovation-2020/>

¹⁵¹ National Academies of Sciences, Engineering, and Medicine; Policy and Global Affairs; Committee on Science, Engineering, Medicine, and Public Policy; Committee on Responsible Science. *Fostering Integrity in Research*. Washington (DC): National Academies Press (US); 2017 Apr 11. 9. Identifying and Promoting Best Practices for Research Integrity. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK475944/>

¹⁵² OECD. *Integrity and security in the global research ecosystem*. OECD Science, Technology and Industry Policy Papers, No. 130; 2020. OECD Publishing, Paris. <https://doi.org/10.1787/1c416f43-en>

¹⁵³ Science Europe Working Group on Research Integrity – Task Group 'Knowledge Growth'. *Seven Reasons to Care about Integrity in Research*. 2015 June 15. Available from: <https://doi.org/10.5281/zenodo.5060024>

¹⁵⁴ Huda N, Pawennei I, Ratri A, Taylor V. *Making Indonesia's Research and Development Better: Stakeholder Ideas and International Best Practices*. 2020. Available from: <https://www.ksi-indonesia.org/assets/uploads/original/2021/02/ksi-1613637314.pdf>

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