

Guidelines for research ethics in science and technology



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Streptococcus thermophilus is a common bacterium in the production of fermented milk products. It was central to the discovery and development of the CRISPR technology.

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PREFACE

These guidelines for research ethics were prepared by the National Committee for Research Ethics in Science and Technology (NENT). The first edition was published in 2007, and the revised edition was published in 2016. These guidelines are supplemented by existing field-specific and international guidelines on research ethics.¹

The guidelines are revised regularly to remain up-to-date. Since the last revision, the research landscape has changed. Open science, the development in artificial intelligence and enabling technologies, and new ways of assessing research are examples of this. The guidelines are revised to reflect these and other developments as well as to ensure an updated terminology.

Some structural changes have also been made in this revision. A new expanded introduction explains the purpose and status of the guidelines. Three appendices have also been added. The proposal for a scientific oath is moved to Appendix 1, Appendix 2 contains a list of references used in the guidelines, and Appendix 3 provides an overview of selected relevant legislation.

The revision of the guidelines was initiated by the previous committee in 2020. A revised draft of the guidelines was circulated for public consultation in March 2023. NENT received 24 comments from Norwegian research actors and discussed these comments in the autumn of 2023. The comments and discussions led to several clarifications and adjustments in the guidelines. NENT would like to thank everyone who contributed to the process.

Oslo, September 2024

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¹ See Appendix II.

Introduction

Purpose

These guidelines for research ethics are intended for both researchers and other stakeholders. They provide students, researchers, and the research community (including the higher education sector, the research institute sector, health trusts, and industry) with an understanding of recognised research ethical norms. The guidelines are advisory and intended to promote good scientific practice and develop research ethical judgment and reflection. They can be of assistance in addressing specific challenges, in the planning of a research project, or in the reporting and publication of findings and results. The guidelines are intended to help prevent scientific misconduct. An important sub-goal of the guidelines is that they should serve as a useful tool in the training of students, research fellows, and employees of research performing organisations.

The guidelines are also intended as a knowledge base document for research administrators, research clients and research funding bodies, public administrators, public and private partners in collaborations, politicians, and the general public. They can be useful tools in discussions about role clarification, clarification of conflicts of interest, and demarcation between research and politics. The guidelines are also relevant for other research-related activities, such as innovation and development. These research ethics guidelines are formulated at a general level. The diversity of subject areas and research topics means that it is neither possible nor desirable to include comments on each individual field or topic. The design is also linked to the need to ensure the stability and recognisability of the guidelines over time. The research ethics guidelines are intended to cover all areas, but they do so without mentioning each individual area. Therefore, the responsible use of the guidelines in a specific area often requires an element of judgment.

Artificial intelligence (AI) and climate change are areas of great importance today. All sections of the research ethics guidelines are relevant to both, as demonstrated in the following examples. With regard to AI, point 4 on justice is important to the development and use of this technology. Points 8 and 9 discuss the responsibility for addressing and communicating the uncertainty and risk connected with the implementation and use of AI. Points 12 and 13 remind us of the importance of protecting individuals against misuse of their data.² With regard to climate change, point 2 recalls the responsibility to contribute to public discourse, while point 3 establishes the principles of sustainable development. Points 8 and 9,

² See also NENT, [*Statement on research ethics in artificial intelligence*](#).

which focus on risk and uncertainty, articulate requirements central to the climate debate. Point 10 emphasises how the research performing organisation and the individual researcher must ensure transparency in possible conflicts of interest, another point that is recognised from debates about climate research.

For more specific research ethics assessments, statements, publications, and resources are available on our website.³ It is also possible to contact NENT for assessments in specific cases and regarding questions that are not sufficiently clarified in the guidelines.⁴

Research ethics

The term ‘research ethics’ refers to a diverse set of values, norms, and institutional arrangements that contribute to constituting and regulating scientific activities. Research ethical norms constitute standards for good research practice and thus express the professional ethics of the research community. One fundamental norm is the search for truth. Research ethics also includes a responsibility towards people, society, and nature (including animals and the environment). These guidelines seek to cover all of these elements for all those involved in research activities.

The guidelines are based on research ethical norms in natural science and technology. Fundamental norms apply across disciplines, while other norms may help define and regulate research within a specific discipline. Therefore, different research areas may have different norms, which is reflected in the national ethics committee system in Norway, with three committees covering all disciplines between them. In interdisciplinary projects, research ethics guidelines for all relevant areas must be followed.

Research is international. The research community transcends national borders. Social, cultural, and political differences affect research practices. Nevertheless, there are fundamental norms that apply regardless of where the research is conducted. These norms are often divided into three groups. The first group comprises internal norms, while the last two groups comprise external norms. Internal norms of the research community concern the research community’s self-regulation, and their purpose is to ensure professional standards. External norms are linked to the relationship between research and society:

³ Previous statements from NENT, publications, and other resources, such as the Research Ethics Library, can be found on NREC’s website, <https://www.forskningsetikk.no/en/>.

⁴ <https://www.forskningsetikk.no/en/about-us/our-committees-and-commission/nent/contact-nent/>

1. Norms constituting good scientific practice, related to the quest for secure, adequate, and relevant knowledge, and norms that regulate the relationship between researchers.
2. Norms regulating relationships to humans and animals participating in or directly affected by the research.
3. Norms regarding the overall social responsibility of research, including the implications of research for society and nature, user interests and the academic responsibility to maintain a well-functioning public discourse.

Internationally, a distinction is often made between research integrity and research ethics.⁵ In the present research ethics guidelines, we adopt a definition of research ethics that encompasses research integrity. Thus, the guidelines express a broad understanding of research ethics that includes good scientific practice, responsibility for the individuals and groups involved in or affected by research, and responsibility for how the knowledge developed is utilised in society and nature.

Responsibility

The responsibility for research ethics is shared between researchers, research performing organisations, and other actors, such as funders, clients, and external collaborators.⁶ Researchers are responsible for ensuring that the research in which they are involved is conducted in accordance with recognised research ethical norms. Research performing organisations must ensure that research ethical norms are adhered to. They are also responsible for providing the necessary training of students and employees, and for ensuring that others involved in research are familiar with research ethical norms. The research performing organisations are responsible for establishing routines for good scientific practice, preventing misconduct, and establishing procedures for handling cases of misconduct at the institution. The institutions must ensure the academic freedom of researchers, including what is sometimes called academic freedom of expression. The institutions should also have mechanisms in place to address and manage other types of research ethical cases, conflicts, and disputes.⁷

⁵ E.g. ALLEA, [European code of conduct for research integrity](#).

⁶ Researchers' duty of care and the institutions' responsibilities are statutory in the Norwegian Research Ethics Act ([in Norwegian](#)).

⁷ See NREC, [Fostering research ethics and research integrity: A guide for research performing organisations](#).

The research ethics guidelines apply regardless of how the research is organised and funded. Clients and funders share responsibility for ensuring that research ethics is safeguarded in the projects they fund. External collaborators must also be familiar with the recognised research ethical norms, whether they are research performing organisations or not.

Research ethics is a prerequisite for the independence of research, or academic freedom, which, in turn, is a prerequisite for the legitimacy of research. Clients, funder, and external collaborators must respect research ethics guidelines and the principles of professional autonomy.

Ethics and law

These guidelines express norms that are ethically binding for the research community. The norms come from and are maintained by the research community itself through self-regulation. Research is also regulated by external requirements and legislation.⁸ Medical and health research and research on animals are particularly heavily regulated by law, including requirements for the ethical pre-approval of research projects. Some of the research ethics guidelines are also included in the legislation. For example, the protection of animals in research is enshrined in these guidelines, in separate ethical guidelines for the use of animals in research and in legislation. Any sanctions are regulated by legislation, not by research ethics guidelines.

Moreover, it is important to realise that ethics and law are not identical. Something may turn out to be ethically questionable even if it is legal or legally problematic or unclear even if it is ethically justifiable. In such cases, researchers must consider whether it is ethically justifiable to conduct the research as planned.

⁸ Appendix III contains a list of the most relevant acts regulating research activities within natural science and technology.

OVERVIEW

The role of research in society

- 1 Researchers and research performing organisations have a responsibility for their role in social development.
- 2 Researchers and research performing organisations have a responsibility to contribute to public discourse.
- 3 Research should be compatible with sustainable development.
- 4 Researchers and research performing organisations have a responsibility for global justice.

Scientific integrity, accountability, and openness

- 5 Researchers are responsible for conducting high-quality research characterised by scientific integrity, truthfulness, and accountability, and research performing organisations and funders must facilitate conditions that promote such practice.
- 6 Researchers must respect the contributions of other researchers and observe recognised standards of authorship and collaboration.
- 7 Researchers and research performing organisations must ensure openness in their research.
- 8 Researchers must comply with national and international rules and regulations established to safeguard ethical and safety interests.

Uncertainty, risk, and the precautionary principle

- 9 Researchers must clarify the degree of uncertainty in their research and assess the risks associated with their research findings.
- 10 Researchers must pay heed to the precautionary principle.

Conflicts of interest and impartiality

- 11 Research performing organisations and individual researchers must ensure transparency in possible conflicts of interest.
- 12 When involved in reviewing the work of others (e.g. articles, theses, applications for funding or for positions), researchers have a responsibility to assess their own qualifications and impartiality.

Protection of persons

13 Researchers must respect the requirement of voluntary, informed consent.

14 Researchers must protect the privacy of their research subjects.

Protection of animals used in research

15 Researchers must show respect for animals and their intrinsic value and safeguard animal welfare.

16 Researchers have a responsibility to minimise disturbance and impact on natural behaviour.

Other bearers of knowledge and forms of knowledge

17 Researchers must acknowledge the use of other forms of knowledge.

18 Where relevant, researchers should engage in dialogue with bearers of other forms of knowledge.

Commissioned research, collaboration, and participation

19 Research performing organisations and the researchers involved must ensure openness and scientific quality in collaborative and commissioned research.

20 Research projects should involve the affected parties where relevant.

Whistleblowing

21 Researchers must have the opportunity and, depending on the circumstances, a duty to act as whistleblowers in matters that they consider to be in conflict with research ethical principles.

22 Research performing organisations must have independent mechanisms that support employees in whistleblowing situations.

Dissemination of research

23 Research performing organisations and researchers are responsible for disseminating research findings.

24 Researchers should not misuse their titles.

GUIDELINES

The role of research in society

Research has value in itself as a basis for new knowledge. This knowledge can be useful in various ways, both in the short and in the long term. The guidelines that concern the obligations of research to society are about the responsibility of researchers and research performing organisations. This responsibility includes ensuring the knowledge base for sustainable development, contributing to public discourse, preventing the unintended use of research with negative consequences for people, society, and nature (including animals and the environment) and complying with recognised international conventions relevant to research ethics.

1 Researchers and research performing organisations have a responsibility for their role in societal development

Researchers and research performing organisations must contribute to the collective development of knowledge and to resolving major challenges facing the global community. Research must not be oriented in such a way that it comes into conflict with the development of democracy or international conventions designed to promote peace. Research must not breach international conventions on civil, political, economic, social, and cultural rights. Researchers must strive to prevent the misuse of scientific and technological development to undermine the right to self-determination, human dignity and the democratic rights of individuals. They have a responsibility to minimise the risk of adverse effects on people, society, and nature, to use society's resources responsibly and to ensure that research benefits society, directly or indirectly.

2 Researchers and research performing organisations have a responsibility to contribute to public discourse

With their expertise, researchers have a responsibility to contribute to an open, nuanced, and informed public discourse and, in doing so, present a balanced picture of professionally justified disagreements. Research performing organisations must enable researchers to fulfil this responsibility.

3 Research should be compatible with sustainable development

Researchers, research performing organisations, and research funders have a collective responsibility to contribute to sustainable development. In this context, sustainability encompasses economic, societal, and environmental aspects. Among the sustainable development goals relevant to natural science and technological research are ensuring food

production, clean water, and access to clean energy; taking action against climate change; preserving biodiversity in water and on land; and contributing to peace and justice.⁹

4 Researchers and research performing organisations have a responsibility for global justice

Research results and their application should as a rule be shared with society as a whole, both nationally and internationally, and specifically with low- and middle-income countries.¹⁰

Research must not be oriented in such a way as to exacerbate global injustice. The benefits, drawbacks, and risks associated with research activities and technological development should be shared fairly. As a general rule, knowledge should be made available to all. Researchers have a responsibility to disseminate knowledge that can help rectify imbalances in the distribution of wealth.

Scientific integrity, accountability, and openness

The search for reliable, comprehensive, and relevant knowledge is fundamental to research. For research to be reliable and legitimate, researchers must follow good scientific practice, which is regulated by the research community itself.

Academic freedom and the independence of research are necessary bases for the development of trustworthy knowledge. To ensure its integrity, research must be free and independent. Academic freedom presupposes responsible self-regulation and good scientific practice.

5 Researchers are responsible for conducting quality research characterised by scientific integrity, truthfulness, and accountability, and research performing organisations and funders must create conditions that promote such practice

Scientific integrity, truthfulness, and accountability are fundamental research ethics requirements. Researchers have an obligation to familiarise themselves with and observe relevant research ethics guidelines. Research performing organisations must ensure that researchers are able to comply with recognised research ethical norms. Funders and clients also have a responsibility to ensure that the research they fund complies with good scientific practice and that researchers are given the freedom and independence necessary to ensure the integrity of the research.

⁹ End hunger (SDG 2), ensure clean water (SDG 6), ensure access to clean energy (SDG 7), climate action (SDG 13), conserve life below water (SDG 14), and on land (SDG 15), promote peace and justice (SDG 16). UN, [*Transforming our world: The 2030 Agenda for Sustainable Development*](#).

¹⁰ WCRI, [*Cape Town Statement on Fostering Research Integrity through Fairness and Equity*](#).

Individual researchers have a responsibility not to accept deviations from good scientific practice, whether this concerns their own actions or those of others. Researchers who discover or are made aware of errors in their research must acknowledge the error, correct it, and ensure that the consequences of the error are minimised.

Researchers must respect the research results of others and exercise good scientific practice. They must not falsify, fabricate, or plagiarise in the planning, execution, or reporting of research. Plagiarism means presenting research or ideas as one's own when this is not the case.

It is in the nature of research to build on research by others. Researchers who take advantage of the ideas and research of others, whether the material is published or unpublished, must follow good citation practices so that it is clear what they are contributing and what they are building on. Researchers must give a balanced and correct presentation of others' research. Citations and references make research traceable and verifiable.

6 Researchers must respect the contributions of other researchers and observe recognised standards of authorship and collaboration

Researchers must observe good publication practices in their field. Researchers must clarify individual responsibilities within collaborations and a framework for co-authorship. In collaborative projects, project managers have a particular responsibility. Supervisors must ensure that the interests of students/candidates are safeguarded. Research performing organisations must ensure that recognised norms for authorship and collaboration are complied with.

When several authors contribute, each authorship must be legitimate. In the Vancouver Recommendations, the International Committee of Medical Journal Editors (ICMJE) recommends that authorship should be based on four criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or reviewing it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

[...] an author should be able to identify which co-authors are responsible for specific other parts of the work. [...] All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Those

who do not meet all four criteria should be acknowledged [...] All individuals who meet the first criterion should have the opportunity to participate in the review, drafting, and final approval of the manuscript.¹¹

Supervisors and project managers must not use their position to gain an unfair advantage related to collaboration and publication. Supervision or project management does not in itself qualify one for co-authorship. So-called honorary authorship is unacceptable.

7 Researchers and research performing organisations must ensure openness in research

Openness in research is important for ensuring scientific quality and fostering society's trust in research and research results. Researchers and research performing organisations must, upon publication, make research results, data and code available to others for verification. Research performing organisations must facilitate the responsible sharing and availability of research.

A principle of open science is that science should be as open as possible and as closed as necessary. Institutions must have guidelines and procedures in place to ensure the responsible storage of research data. As a general rule, research data should be findable, accessible, interoperable and reusable.¹²

The need to restrict openness due to commercialisation, for example, must not occur at the expense of quality. As a general rule, researchers should publish their results. Any limitations to this obligation must be ethically responsible, clearly justified, and explicitly clarified between the parties.

8 Researchers must comply with national and international rules and regulations established to safeguard ethical and safety interests

Good research practice entails observing national laws and rules, both in one's home country and abroad. In interdisciplinary projects, research ethics guidelines for other disciplines must also be followed. At the outset, the parties involved in interdisciplinary and international research collaboration should clarify the research ethical framework.¹³

Other countries may have different standards for ethical research practices. If this is the case, researchers must consider whether it is ethically justifiable to conduct research within that framework. Researchers must not locate parts of their research in other countries for the purpose of availing themselves of lower ethical or safety standards. They must inform funding

¹¹ ICMJE, *Recommendations for the Conduct, Reporting, Editing, and Publication of Scholarly Work in Medical Journals*, 2.

¹² Go Fair, *The FAIR Guiding Principles for scientific data management and stewardship*. See also Global Indigenous Data Alliance, *CARE-principles for indigenous data governance*.

¹³ WCRI, *Montreal Statement on Research Integrity in Cross-Boundary Research Collaborations*.

institutions of any nonconforming ethical or safety standards in the countries in which their research is conducted.

Uncertainty, risk, and the precautionary principle

Research and technology development may have far-reaching consequences for health, society, and the environment. Concerns about the destructive impact of human activity on the environment led to the development of the precautionary principle.¹⁴ This, in turn, led to an increased awareness that scientific methods are not always sufficient for determining whether an intervention will have negative consequences.

It is important that researchers assess and communicate uncertainty and risk in connection with their research and that decision-makers who use scientific knowledge have a thorough understanding of the validity and the context of this knowledge. Uncertainty and risk are also relevant to research ethics in cases in which they cannot be quantified. While uncertainty generally is a neutral characterization, risk denotes something negative or an undesirable consequence.

9 Researchers must clarify the degree of uncertainty in their research and assess the risk associated with the research findings

Researchers must clarify the precision, uncertainty, and possible limits to the validity of their research results. This is part of researchers' ethical responsibility and striving for objectivity. In addition to presenting knowledge critically and in context, researchers must strive to point out any risk and uncertainty factors that may have a bearing on the interpretation and possible application of the research findings.

10 Researchers must pay heed to the precautionary principle

The precautionary principle is defined here as follows: 'When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm.'¹⁵

This principle is important for much of natural science and technology research,¹⁶ and it concerns both man-made and natural risks. Researchers share a responsibility for facilitating risk evaluations based on the precautionary principle and for contributing to avoiding or diminishing harm. When there is plausible but uncertain knowledge that an innovation, a

¹⁴ The principle was included in [UN, Framework Convention on Climate Change](#) (Rio-declaration), article 3, 1992.

¹⁵ UNESCO COMEST, [The precautionary principle](#), 14.

¹⁶ One example is artificial intelligence research. See NENT, [Statement on research ethics in artificial intelligence](#), part B.

technological application or a development of a research field may lead to ethically unacceptable consequences for people, society, or nature (including animals and the environment), the researchers in the field in question must strive to contribute knowledge that is relevant for observing the precautionary principle. This means that researchers must work together with other parties where relevant.

Conflicts of interest and impartiality

The independence and transparency of research affect society's trust in it. Trust in research may be tested if doubts are raised about the circumstances that have influenced the research. Such circumstances may concern the interests of researchers and research performing organisations, or influence from authorities, funders or partners in collaborations. To counteract illegitimate influence and the weakening of trust in research, it is important to be transparent about the role of the researcher, the research, and its funding. This applies to all research but may require more attention in commissioned research in which the varying interests of the collaborating parties may put the research under more pressure.

11 Research performing organisations and individual researchers must ensure transparency about possible conflicts of interest

Research associated with, for example, political or religious interests, or research commissioned by industry or government authorities, may generate uncertainty as to whether there are factors that have unduly influenced the research results. Transparency about the factors related to impartiality, such as other roles or external affiliations that researchers may have, may strengthen confidence that the research results are independent and reliable.

Researchers and institutions must ensure that researchers

- a) are transparent about funding and relevant financial relationships
- b) are transparent about relevant positions and other work in political, religious, or other value-based associations that may potentially influence their research, as well as about personal relationships that may appear problematic
- c) clarify whether they are speaking as researchers or in some other capacity.

12 When involved in reviewing the work of others (e.g. articles, theses, applications for funding or for positions), researchers have a responsibility to assess their own qualifications and impartiality

Impartiality is important for maintaining public trust. If researchers are in doubt about their own impartiality, they should not take part in the review. Researchers must also consider whether others may question their impartiality.

Researchers as peers must

- a) consider their role as reviewers if they are in conflict with the person(s) in question
- b) consider their role as reviewers if they have a direct cooperative or competitive relationship with the person(s) in question
- c) be open about other factors that may affect or cast doubt on their professional judgment
- d) acknowledge relevant limitations of their expertise.

Protection of persons

Research involving human subjects raises specific demands related to respect for their inviolability and safety. This includes researchers' responsibility to obtain consent, provide adequate information and ensure privacy. These requirements may be more stringent in research involving vulnerable groups or children. Researchers must also take into account others who are affected by the research, such as relatives, guardians, owners of animals being researched, and people who contribute with observations, photos, and the like.¹⁷

13 Researchers must respect the requirement of voluntary, informed consent

When research involves humans as research subjects, researchers must, as a general rule, obtain consent. In terms of research ethics, consent is a measure that helps ensure that individuals are respected. Therefore, the consent must be voluntary, informed, unambiguous, and preferably documentable. The general requirements regarding consent entail researchers ensuring that the person or persons who consent to take part in the research

- a) understand the purpose of the project and their role in it
- b) are able to assess their own situation
- c) can independently decide whether they want to participate, without external pressure, on the basis of information and their own preferences and values
- d) can freely communicate their decision
- e) can withdraw their consent at any time.

Research on children, persons with impaired capacity to consent and other vulnerable groups may require special measures.

¹⁷ When processing personal data, the Act of 15 June 2018 no. 38 relating to the processing of personal data (The Personal Data Act) also applies. For medical and health research on humans, human biological material or health information, the Act of 20 June 2008 no. 44 on medical and health research (Health Research Act) applies. The National Committee for Research Ethics in the Social Sciences and the Humanities (NESH) has drawn up more detailed guidelines concerning research participants within their fields (NESH, [Guidelines for research ethics in social sciences and the humanities](#), part B).

14 Researchers must protect the privacy of their research subjects

Information about the persons participating in the research project or about others with whom researchers become acquainted during the research process must be handled with care. Extra care must be taken when sensitive information is collected. Prior to collection it should be clarified how long the material will be stored, how it will be shared, and whether it will be deleted or anonymised at the end of the project. Researchers must inform participants about how the data will be protected and stored. Researchers must also ensure confidentiality or anonymity for those participants who want it. *Confidentiality* means limiting who can access the information and under what conditions. *De-identification* means that data can only be linked to a person through a key. With *anonymity*, it should in principle not be possible to identify which individuals the information and material originate from.

Protection of animals used in research

Some research involves animals, either as model organisms or through direct animal-related research. Animals are sentient beings with the capacity to feel pain. The interests of the animals and good animal welfare must be included in ethical considerations concerning harm and benefits to humans, animals, and the environment.¹⁸

15 Researchers must respect animals and their intrinsic value and safeguard animal welfare

Researchers must carefully consider whether it is necessary to use live animals in research. In their considerations, researchers must always apply the three R's, namely replacement, reduction, and refinement, before, during and after conducting the experiment. Animals should only be used in research when the results are important for humans, animals or the environment.

16 Researchers have a responsibility to minimise disturbance and impact on natural behaviour

The disturbance of animals and the impact on natural behaviour must be minimised for individual animals, populations, and their environment. Researchers must strive to ensure that the results of the research are not used contrary to the basic requirements for good animal welfare.

¹⁸ See NENT, [Ethical Guidelines for the Use of Animals in Research](#) for further information. The protection of animals in general and in research in particular is covered by legislation, regulations and guidelines that the researcher is obliged to follow.

Other bearers of knowledge and forms of knowledge

All societies have a range of types of knowledge. Researchers, professionals, and laypeople have different kinds of experience-based knowledge. Individuals and local communities may possess specific local knowledge. Traditional knowledge refers to a cumulative body of knowledge, know-how, practices, and representations maintained and developed through experience, often over generations.¹⁹ These types of knowledge and their bearers should be treated with due respect and protected against unreasonable exploitation.

17 Researchers must acknowledge the use of other forms of knowledge

Researchers who directly use or build their research on other forms of knowledge have an obligation to acknowledge the economic and cultural values of this knowledge. When such research results in financial gains, a share of the gain should benefit the bearers of traditional knowledge. The traditional knowledge of indigenous peoples has particularly strong legal protection against unreasonable exploitation.²⁰

18 Where relevant, researchers should engage in dialogue with bearers of other forms of knowledge

Experience-based, local, and traditional knowledge arise from lived experience. Although these forms of knowledge do not necessarily meet the usual standards for scientific knowledge, they may be an important supplement to understanding the nature, environment, and living conditions of particular populations and local communities, thereby benefiting both research and society at large. Researchers should be open to utilising relevant kinds of knowledge. Therefore, it is important for researchers to enter into a dialogue with the bearers of this knowledge, not least in applied research, which can potentially affect local communities and their living conditions. International organisations have placed particular emphasis on the need to respect and use the traditional knowledge of indigenous peoples in environmental research.²¹

Commissioned research, collaboration, and participation

Research and innovation are often carried out in collaboration with external partners or on behalf of external research clients. When external actors influence design and thematic

¹⁹ International Science Council, [Science and traditional knowledge](#).

²⁰ E.g. through international conventions such as the [Nagoya Protocol](#). See also Global Indigenous Data Alliance, [CARE-principles for indigenous data governance](#).

²¹ Among others, [IPBES](#).

delimitations to a greater or lesser extent, the difference in expectation and interest might place research ethical norms under increased pressure.

19 Research performing organisations and the individual researchers involved must ensure transparency and scientific quality in collaborative and commissioned research

The legitimacy of research depends on there being no doubt about the reliability and integrity of its results. Therefore, there may be all the more reason to be transparent about personal or professional ties, conflicts of interest, and impartiality when the research is conducted in collaboration with others or is funded by external research clients. Research performing organisations, research clients, and partners in collaborations must ensure that basic considerations of academic freedom and research ethics are taken care of in all agreements on research and investigation assignments. Research performing organisations and research clients should be clear about which tasks or parts of tasks are research and which are consultancy services.²²

To ensure scientific quality, collaborative and commissioned research should be organised so that

- a) researchers have the overall responsibility for the choice of method, data acquisition, interpretation of findings, and reporting
- b) the research is based on the greatest possible transparency
- c) research findings must be made available to other researchers
- d) exclusive right to use research results has a time limit.

Research performing organisations are responsible for ensuring that the research results are made public on the expiry of an agreed-upon, limited-time exclusive right-of-use by the funder.

20 Research should involve the affected parties where relevant

The participation of users, private citizens, or other stakeholders can increase the relevance of research, contribute to greater fairness, and provide a democratic corrective. It can influence the focus and aim of the research and how it is organised and conducted.²³

Researchers, research performing organisations, and research funders must ensure that the integrity of the research is also safeguarded in projects involving multiple actors.

²² For research assignments, the [Norwegian state's standard agreement for research and investigation assignments](#) (SSA-F), which safeguards academic freedom and research ethics, should be used instead of the standard agreement for consultancy services (SSA-O).

²³ Such involvement is enshrined in a number of international conventions, including the [Aarhus Convention](#). The European Citizen Science Association (ECSA) has developed 10 principles for good citizen science practice: ECSA, [10 principles of citizen science](#).

Whistleblowing

Whistleblowing occurs when employees report issues of concern at their own institution or elsewhere. In addition to whistleblowing as defined under the Working Environment Act, whistleblowing may concern internal matters in research connected to scientific misconduct, or it may concern broader research ethical issues with other types of social or environmental impact. It is in this broader sense that the term whistleblowing is used here.

Institutions must handle whistleblowing cases in an appropriate manner in accordance with applicable procedures and regulations. Institutions must ensure that the legal protection and reputation of those involved are not jeopardised.²⁴

21 Researchers must have the opportunity and, depending on the circumstances, a duty to report matters that they consider to be in conflict with research ethical principles

In concrete terms, this means that researchers must

- a) assess whether there are grounds for whistleblowing
- b) assess the possible consequences of such whistleblowing for themselves, the person accused, the research performing organisation, and society
- c) assess the possible consequences of not reporting
- d) identify the whistleblowing channels best suited for minimising conflict and optimising actions to remedy the damage.

22 Research performing organisations must have independent mechanisms that can support employees in whistleblowing situations

It is important that all parties involved in a whistleblowing situation respect the fact that the process must be dealt with in an unbiased manner. An independent body must handle the process, and those involved must be protected from unreasonable or inappropriate reactions.

The responsibility of research performing organisations means that

- a) research performing organisations must have mechanisms for taking care of the whistleblower and the person accused
- b) research performing organisations must have mechanisms for conducting such an independent investigation of whistleblowing cases within the institution
- c) these mechanisms must be known to the researchers at the institution.

²⁴ Whistleblowing on issues of concern in the employer's undertaking is regulated by Act no. 62 of 17 June 2005 relating to the working environment, working hours and employment protection, etc. (Working Environment Act). For protection of whistleblowers in research, see ENRIO, [*Handbook on whistleblower protection in research*](#).

Dissemination of research

Disseminating research to a broader audience beyond the research community is a social responsibility. Research dissemination is one of the core tasks of researchers; therefore, individual researchers should give this a high priority.

Institutions must enable researchers to contribute to this dissemination. The dissemination of research and participation in relevant public debates should be routine parts of research activity.

23 Research performing organisations and researchers are responsible for disseminating research findings

This means that

- a) research performing organisations should facilitate appropriate, customised dissemination
- b) research performing organisations should have procedures for assessing the relevance of research for various user groups and society as a whole
- c) research performing organisations and individual researchers should regularly consider how their own research can be suitable for dissemination to the broader public, and follow up with appropriate action
- d) research performing organisations must protect researchers' academic freedom and provide support in cases in which researchers are exposed to inappropriate reactions based on their research dissemination.

24 Researchers should not misuse their titles

Researchers should contribute to public discourse with professionally based argumentation.

Such participation means that researchers must use their professional expertise as a basis for contributing to the formation of public opinion. It may be a matter of contributing information to an area that is the subject of debate, taking a reasoned position on controversial subjects or putting new topics on the public agenda.

When participating in public discourse, researchers must be accountable, honest, and objective, and they must present their arguments with professionally based justifications and clarity. Researchers should be clear about when they are participating as professionals and when they are participating as private individuals. When researchers participate without relevant academic expertise, they should not use their titles or refer to special scientific expertise or research performing organisations to give their opinions greater weight.

APPENDIX I

Proposed scientific oath

Research ethics guidelines should be well known in research communities and should especially reach those who are newly recruited into the research community. Acknowledging and accepting these guidelines means that individual researchers are making a personal commitment. Therefore, we propose that research performing organisations should consider whether it is reasonable to ask every individual to make a declaration of good research ethics practice. The following is a proposal for such a declaration:

I acknowledge that I am part of an international community of researchers. I will practise my activities in accordance with the recognised standards of good research practice. I shall conduct my research in an honest and truthful way and show respect for humans, animals, and nature. I shall use my knowledge and skills to the best of my judgment for the good of humanity and for sustainable development. I shall not allow interests based on ideology, religion, ethnicity, prejudice, or material advantage to overshadow my ethical responsibility as a researcher.

APPENDIX II

Resources referred to in the guidelines

Aarhus Convention. “Convention on access to information, public participation in decision-making and access to justice in environmental matters.” 1998.

<https://lovdata.no/dokument/TRAKTATEN/traktat/1998-06-25-1>

All European Academies (ALLEA). *European code of conduct for research integrity*. 2023.

<https://allea.org/portfolio-item/european-code-of-conduct-2023/>

European Network of Research Integrity Offices (ENRIO). *Handbook on whistleblower protection in research*. 2023. <http://www.enrio.eu/wbp/>

European Citizen Science Association (ECSA). “10 principles of citizen science.” 2015.

<https://ecsa.citizen-science.net/documents/>

Global Indigenous Data Alliance (GIDA). “CARE principles for indigenous data governance.” 2020. <https://www.gida-global.org/care>

Go Fair. “FAIR guiding principles for scientific data management and stewardship.” 2016.

<https://www.go-fair.org/fair-principles/>

International Committee of Medical Journal Editors (ICMJE). “Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals.” 2023.

<http://www.icmje.org/icmje-recommendations.pdf>

Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).

“Indigenous and local knowledge in IPBES”. Accessed 9 August, 2024.

<https://www.ipbes.net/indigenous-local-knowledge>

International Science Council. “Science and traditional knowledge.” 2002,

<https://council.science/wp-content/uploads/2017/05/Science-traditional-knowledge.pdf>

“Nagoya protocol on access to genetic resources and the fair and equitable sharing of benefits arising from their utilization to the convention on biological diversity.” 2010,

<https://lovdata.no/dokument/TRAKTATEN/traktat/2010-10-29-59>

National Research Ethics Committees. *Fostering research ethics: A guide for research performing organisations*. 2023. <https://www.forskningsetikk.no/en/resources/fostering-research-ethics/>

National Committee for Research Ethics in Science and Technology (NENT). *Ethical guidelines for the use of animals in research*. 2018. <https://www.forskningsetikk.no/en/guidelines/science-and-technology/ethical-guidelines-for-the-use-of-animals-in-research/>

National Committee for Research Ethics in Science and Technology (NENT). *Statement on research ethics in artificial intelligence*. 2019. <https://www.forskningsetikk.no/globalassets/dokumenter/4-publikasjoner-som-pdf/statement-on-research-ethics-in-artificial-intelligence.pdf>

United Nations (UN). *Framework convention on climate change*. 1992. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf

United Nations (UN). *Transforming our world: The 2030 agenda for sustainable development*. 2015. <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>

UNESCO COMEST. *The precautionary principle*. 2005. <https://unesdoc.unesco.org/ark:/48223/pf0000139578>

World Conferences on Research Integrity (WCRI). “Montreal statement on research integrity in cross-boundary research collaborations.” 2013. <https://www.wcrif.org/downloads/main-website/montreal-statement/123-montreal-statement-english/file>

World Conferences on Research Integrity (WCRI). “Cape Town statement on fostering research integrity through fairness and equity.” 2023. <https://www.wcrif.org/guidance/cape-town-statement>

Wilkinson, M., M. Dumontier, I. Aalbersberg, et al. “The FAIR Guiding Principles for Scientific Data Management and Stewardship.” *Scientific Data* 3: 160018. (15.3.2016). <https://doi.org/10.1038/sdata.2016.18>

APPENDIX III

Relevant legislation for research in science and technology

This list is not exhaustive. Some acts have not been translated into English. The translations provided are not official and only for information purposes. The links to the official Norwegian versions are in parentheses.

- Research Ethics Act ([forskningsetikkløven](#))
- Act on medical and health research ([helseforskningsloven](#))
- [Act relating to the processing of personal data](#) ([personopplysningsloven](#))
- [Animal Welfare Act](#) ([dyrevelferdsloven](#))
 - Regulation concerning the use of animals for scientific purposes ([Forskrift om bruk av dyr i forsøk](#))
- Act relating to the application of biotechnology in medicine ([bioteknologiløven](#))
- [Act relating to universities and university colleges](#) ([universitets- og høyskoleloven](#))
- Act relating to control of the export of strategic goods, services, technology, etc. ([eksportkontrolløven](#))
 - Regulations relating to the export of defence-related products, dual-use items, technology and services ([Forskrift om eksport av forsvarsmateriell, flerbruksvarer, teknologi og tjenester](#))
- [Marine Resources Act](#) ([havressurslova](#))

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