Forskningsrådet

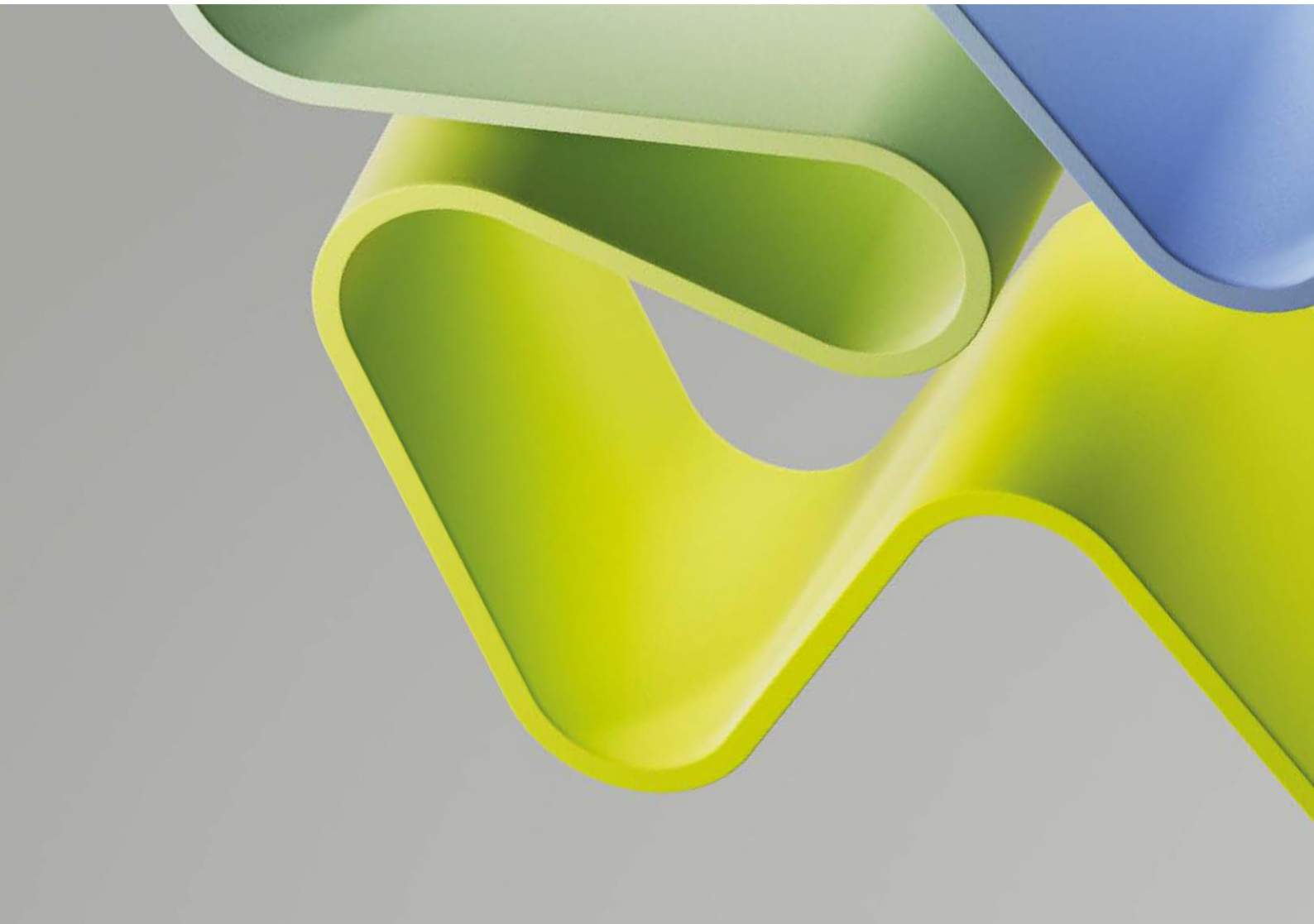
Evaluation of Life Sciences 2022-2024

Evaluation of medicine and health 2023-2024

Evaluation report

ADMIN UNIT: Faculty of Medicine and Health Sciences
INSTITUTION: Norwegian University of Science and Technology (NTNU)

December 2024



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Statement from Evaluation Committee Higher Education Institutions 4

This report is from Evaluation Committee Higher Education Institutions 4 which evaluated the following administrative units representing the higher education sector/institute/hospital trust in the Evaluation of medicine and health 2023-2024:

- Faculty of Health Sciences and Social Care, Molde University College
- Faculty of Medicine and Health Sciences, NTNU
- Department of Clinical Dentistry (IKO), UiT Arctic University of Norway
- Department of Community Medicine, UiT Arctic University of Norway
- Department of Medical Biology (IMB), UiT Arctic University of Norway
- Faculty of Health and Sport Sciences, University of Agder (UiA)
- Department of Global Public Health and Primary Care, University of Bergen (UiB)

The conclusions and recommendations in this report are based on information from the administrative units (self-assessment), digital meetings with representatives from the administrative units, bibliometric analysis and personnel statistics from the Nordic Institute for Studies of Innovation, Research, and Education (NIFU) and Statistics Norway (SSB), and selected data from Studiebarometeret (NOKUT). The digital interviews took place in Autumn 2024.

This report is the consensus view from committee Higher Education Institutions 4. All members of the committee have agreed with the assessments, conclusions and recommendations presented here.

Evaluation committee Higher Education Institutions 4 consisted of the following members:

Professor Anja Krumeich (Chair)
Maastricht University

Professor John de Wit
Utrecht University

Professor Paul Hatton
University of Sheffield

Professor Marialuisa Lavitrano
Milano-Bicocca University

Professor Patrik Midlöv
Lund University

Professor Louise Torp Dalgaard
Roskilde University

Rebecca Babb, Technopolis Group, was the committee secretary.

Oslo, December 2024

Profile of the administrative unit

The Faculty of Medicine and Health Sciences at NTNU is led by the Dean. The 8 heads of departments, the Dean, and the Vice-Deans constitute the faculty leader group. They meet bi-weekly for discussions and give advice before the Dean decides economic and strategic priorities. The faculty's 8 departments are organiSed into academic units/groups. Each department manages research activities, recruitment, and personnel allocation, while the Dean allocates internal strategy funds for PhD and postdoc positions to enhance research quality. The research staff at the faculty consists in FTE of 125, 6 professors, 165,3 associate professors, 127,8 researchers, 64,3 post-docs and 296 PhD-students. Women represent a majority in all categories except among professors where they represent 41,5 percent.

22 of the faculty's research groups participate in this evaluation: Centre for Care research East, CEMIR, CancerPalliative, Labmed, NTNU Low Birth Weight in a Lifetime Perspective, Women's health, NorHEAD, Integrative Neuroscience Group, IMPACTS, GeMS, Regional Centre for Child and Youth - Mental Health and Child Welfare, Regforsk, HUNT Research Centre, HUNT MCR, Musculoskeletal Research Group, Anaesthesia and Emergency Medicine unit, MR unit, Exercise, Circulation & Respiration, The Ultrasound Research Group, Space, time and memory, Sensory and Motor Systems, and Circuits and Plasticity.

The strategy of the faculty reflects the University's overall strategy and applies for the same period (2018-2025). Some of the main strategic goals for research and innovation are to strengthen cooperation with the health services to reach a high international level in clinical research, increase the scope and quality of basic and translational research, stimulate bold research aimed at ground-breaking discoveries and take advantage of the proximity to strong technological communities, the HUNT population survey, regional biobanks, health registers and electronical records, and strengthen interdisciplinary research and collaboration with internationally leading groups to increase the number of EU-funded projects. Additionally, the faculty aims to develop strong innovation skills in candidates and employees and take advantage of the collaboration with external technology companies in developing new health technology.

The faculty is largely co-located with the St. Olavs university hospital and collaborates closely on both education and research. The faculty also collaborates closely with Gjøvik, Oppdal, Ålesund and Trondheim municipalities through university municipality agreements. There are formal structures for collaboration both between the faculties within NTNU and with the three other Norwegian faculties for medicine and health science (Oslo, Bergen, and Tromsø). The MH-faculty's other national strategic collaboration partners are Sintef, the National Welfare Directory (NAV), Nord Trøndelag and Møre & Romsdal Health trusts and the Central Norway Regional Health Authority. The faculty's international strategic collaboration research partners include Yale University, Uppsala University, Katmandu University and Linköping University.

According to its self-assessment, in the future, the faculty will develop knowledge for a better world by leveraging its current advantages (e.g. proximity to schools of engineering/technology, close collaboration with the health services – primarily in the integrated university hospital but also with NAV and municipalities, Kavli Institute for Systems Neuroscience, and access to good quality health/population data). However, the faculty will face challenges such as limited research time due to prioritising patient

treatment and teaching, insufficient strategic funds, immature research groups, and limited administrative capacity. Externally, it has opportunities to produce research-based knowledge for political decisions, contribute to sustainable healthcare, and increase participation in European research programs, but must navigate challenges like recruiting and retaining personnel, global conflicts, economic decline, regulatory issues, and the need to adapt to technological advancements such as AI while maintaining public trust through high ethical standards.

Overall evaluation

The Faculty of Medicine and Health Sciences at the Norwegian University of Science and Technology (NTNU) has clear strategic goals that are well described. It has a specific strategy for the education of Ph.D. candidates, for basic research and for activities that aim to contribute to the resolution of major health challenges. The scientific focus of the research groups is well aligned with the focus and aims of the research of the administrative unit. The faculty's prioritisation of finances, positions, and other internal resources are allocated in agreement with the strategic goals to further heighten the impact of the research and ensure compliance with the Ministry's long-term plan for research and education. The faculty has been successful in obtaining competitive national and international grants. It is commendable that external R&D funding constitutes approximately 50 % of the annual faculty budget. The faculty provides administrative support for grant application and project design and management directed towards early career researchers and research groups who are taking the step up from internal funding to apply for external funding.

The organisation of research at faculty is well structured and strengths relate to the synergies with St Olavs hospital and several municipalities on health research collaboration. The extensive network of national and international collaborators, the use of several national infrastructures and the participation in European infrastructures elevates the department's profile, helping to attract top talent, collaborators, and students. The weaknesses of the faculty relate to the large size of some research groups and diversity of sub-groups, the domination of research output and funding by few sub-groups and specifically high-performing senior investigators. It is of concern that the faculty departments find it particularly challenging to recruit PhD students because of financial challenges and there is no plan or prospect for further staff growth.

The NTNU has developed policies for innovation including IP policies, new patents, licenses, start-up/spin-off guideline. The faculty has dedicated personnel for innovation support and a Student Innovation Centre for healthcare professionals and all students in technology disciplines. However, most researchers do not consider innovation to be their job. Engagement in open science does not address other pillars other than open access publishing. The share of publications with gold open access has increased during the period, but there still is need of improvement to reach the goal of 100% open access.

NTNU has policy against discrimination characterised by an equality-diversity-inclusive work culture that makes the faculty an attractive workplace, but it is not explicitly mentioned whether the policies and actions pertain to staff as well as students.

The faculty contributes to the objectives and goals for higher education institutions, with strong commitment to research, innovation and education for better global health. The UN Sustainable Development Goals have also been closely integrated in the NTNU and faculty's strategies from 2018.

Recommendations

Developing a forward-looking research strategy for faculty requires leveraging its unique strengths and aligning with international trends. The evaluation committee recommends:

- Leverage Proximity to Engineering and Technology Schools to further advance biomedical engineering, particularly in medical devices, imaging technologies, and robotic surgery.
- Focus on research integrating artificial intelligence, machine learning, and big data analytics into healthcare, exploring areas such as predictive diagnostics, personalised medicine, and health informatics.
- Capitalise on integration with St. Olavs Hospital by establishing dedicated innovation hubs within the hospital, which bring together clinicians, researchers, and industry partners to focus on translational research, allowing findings from the lab to be rapidly tested and implemented in clinical settings, particularly in areas like cancer, cardiovascular diseases, and neurology.
- Prioritise research into managing patients with multiple chronic conditions, with a focus on developing comprehensive care models and intervention strategies. Invest in health services research to optimise the delivery of healthcare, focusing on efficiency, patient experience, and reducing hospital readmissions.
- Maximise access to Norway's high-quality health and population data for large-scale epidemiological studies, focusing on public health trends, disease prevention, and health inequalities. Apply advanced data analytics and AI to develop public health interventions that target specific demographic groups.
- Conduct longitudinal studies providing data for understanding the impact of lifestyle, environment, and genetics on health, as well as foresight studies to predict future healthcare needs based on demographic trends, guiding long-term research and planning efforts at the faculty.
- Consider whether a reduction in or restructuring of several research groups and/or reduction of the number of thematic areas where the faculty wants to be strong, which can help overcome the weakness related to differences in size and quality of output.
- Diversify funding sources i.e. increase participation in European research programs, seek funding from philanthropic organisations and foundations, explore public-private partnerships that align with NTNU's research priorities, and securing additional funding while ensuring research addresses real-world challenges.
- Continue to support participation in national infrastructures that provide access to cutting-edge technology, large-scale computational resources, and specialised equipment. Leverage NTNU's access to biobanks for biomarker research, identifying predispositions to diseases and tailoring public health interventions.
- Map existing collaborations and identify gaps in strategic collaborations from a faculty-wide perspective and for the research groups and implement a strategy to address the gaps.
- Forge strategic alliances with leading global universities and research institutions, facilitating student and faculty exchanges, joint research, and collaborative publications. Partner with global healthcare companies and technology firms to co-develop cutting-edge solutions, benefiting from shared resources and expertise.
- Significantly reduce the number of temporary posts, especially at the junior level (researchers, scientific assistants) and administrative posts, supporting retainment of staff and generating an inclusive culture where people feel a sense of belonging.

- Improve gender parity at post-doc, and full Professor level supporting career development of female early career researchers and their transition into faculty posts.
- Develop and implement policies and strategies and make available resources to enable researchers to engage with all pillars of open science, aligned with state-of-the art open science approaches.
- Increase awareness and motivation across the faculty staff and generate a culture of innovation. Facilitating regular contact for exchange between academic staff, technology transfer offices and industry would be beneficial.
- Develop strategies for training the future healthcare workforce that is equipped to handle the challenges posed by an aging population and increasing demand for primary care.
- Develop interdisciplinary graduate programs that combine medicine, engineering, and data science, preparing students for careers at the intersection of these fields.

1. Strategy, resources and organisation of research

1.1 Research strategy

The Faculty of Medicine and Health Sciences houses all medicine and health disciplines at NTNU, except for Biomedical Laboratory Science and Psychology. The faculty is integrated with the University hospital of St. Olav which is the local hospital for the population of southern Trøndelag and collaborates closely on both education and research. The faculty includes 8 departments and is home for 11 research institutes: the Kavli Institute for Systems Neuroscience, the Trøndelag Health Study (HUNT), Norwegian Centres of Excellence (SFF): Centre for Neural Computation (CNC) and Centre of Molecular Inflammation Research (CEMIR); one Centre for Research-based Innovation (SFI): Centre for Innovative Ultrasound Solutions (CIUS); one Centre for Clinical Treatment Research (FKB): Norwegian Centre for Headache Research (NorHEAD); K. G. Jebsen Center for Genetic Epidemiology and K. G. Jebsen Centre for Alzheimer's Disease.

The mission of the faculty includes research, innovation, education and dissemination within the field of medicine and health. The main field for research covers basic science, translational research, clinical research and research on public health and health systems. The strategic goals are indicated in the faculty's strategy "Health for a better world":

- The quality of faculty activities is consistently high, and at least one group in each department has an internationally leading position.
- The faculty is an attractive partner for internationally recognised research and educational institutions.
- The knowledge that faculty creates in cooperation with users, health services, the business community and other stakeholders influences the development of society.
- The faculty's academic activities provide an evidence base for coherent and sustainable priorities in health policy.
- The faculty educates outstanding graduates who are attractive in their respective fields on the national and international labour market.
- The faculty establishes a culture of innovation in health.
- The faculty strengthens their commitment to research, innovation and education for better global health.
- The faculty's students and staff contribute to positive social development in the cities and regions where it is active.

The strategic goals are approved by the faculty board and followed up in a development plan and in annual action plans. Prioritisation of finances, positions, and other internal resources are allocated in agreement with the strategic goals. The scientific focus areas of the research with the highest publication volume are: Public, Environmental and Occupational Health; Neurology; Biomedicine; Nursing; Multidisciplinary natural sciences; and General medicine.

Researchers at faculty collaborate closely with several actors in society to implement findings into practice, e.g. the development of the Covid-19 test during the pandemic; data and biological samples collected over four decades in the HUNT population study that led to major discoveries resulting in societal impact, advice to the public regarding health, and ground-breaking discoveries within neuroscience by the Kavli groups.

The committee's evaluation

The committee acknowledge that the faculty has clear strategic goals that are well described. The faculty's strategy has a focus on basic research and on the education of PhD candidates. Furthermore, it acknowledges the need to contribute to solving major health challenges. The committee appreciates that the scientific focus of the research groups is well aligned with the focus and aims of the faculty research. By strategic prioritisation of collaborative partners and allocating funds for infrastructure and thematic areas, the faculty has further strengthened the impact of its research and ensured compliance with the Ministry's long-term plan for research and education. The committee commends that the faculty participates in and supports researcher participation in international and national expert committees, boards and discussions, facilitating both the creation of new knowledge and policies important for society.

The committee´s recommendations

- Leverage Proximity to Engineering and Technology Schools. Deepen collaborations with the School of Engineering to further advance biomedical engineering, particularly in medical devices, imaging technologies, and robotic surgery. Focus on research integrating artificial intelligence (AI), machine learning, and big data analytics into healthcare, exploring areas such as predictive diagnostics, personalised medicine, and health informatics.
- Capitalise on Integration with St. Olavs Hospital. Strengthen clinical research programs by establishing dedicated units within St. Olavs Hospital that focus on translational research, where findings from the lab are rapidly tested and implemented in clinical settings. Enhance research that prioritises patient outcomes, safety, and quality of care, ensuring that new treatments and interventions are both effective and patient friendly.
- Expand Translational Research Initiatives: Create structured programs that facilitate the transition of research discoveries from the laboratory into clinical practice, particularly in areas like cancer, cardiovascular diseases, and neurology. Develop innovation hubs within the hospital that bring together clinicians, researchers, and industry partners to co-create and test new healthcare solutions.
- Maximize Access to High-Quality Health and Population Data. Utilize Norway's rich health and population data for large-scale epidemiological studies, focusing on public health trends, disease prevention, and health inequalities. Apply advanced data analytics and AI to extract actionable insights from health data, improving disease prediction, patient stratification, and treatment outcomes.
- Personalised Public Health: Use population data to develop personalised public health interventions that target specific demographic groups, improving the effectiveness of prevention and treatment programs. Engage in research that informs health policy, utilising population data to shape policies that address key public health challenges.

1.2 Organisation of research

The Faculty of Medicine and Health Sciences includes 8 departments organised into academic units/groups according to educational assignments and/or to research activities. The size of the units differs, from small to large groups consisting of subgroups. The head of department makes decisions on research priorities and proposals, and is responsible for recruitment, setting up career plans for the department's employees, and for personnel-time dedicated to research and innovation activities. The faculty's day-to-day operations are

managed by the Dean, Vice-Deans and the 8 Heads of Department which constitute the faculty leader group. The faculty research infrastructure is organised in core facilities co-managed with St Olavs hospital. Administrative support services (about 90 positions, divided into five units) are located at both department level and faculty level, and are collectively localised in one building.

NTNU has put much focus on career development, with clear policies for PhD, Postdoc and researcher positions, tenure track schemes and mentoring programs for scientific staff aspiring for professor positions.

22 research groups participate in this evaluation. Synergies between the faculty are achieved through regular meetings between the administration section leaders. A close collaboration between the faculty and department administrative units ensures that the study programmes levels are research based. HR and Research units collaborate for the development of career for PhD, Postdoc and research positions and tenure track schemes for scientific staff aspiring for professor positions. Financial and Research units actively collaborate for the management of funding. Collaboration is also with other administrative units at NTNU and with St. Olavs hospital/the integrated university hospital. The academic staff/personnel include teaching activities only, research activities only or any combination. Many researchers and health professionals (about 370) are employed in combined positions between the hospital and the university. The proportion of total academic staff from the 8 departments range from 30% to 100%. The gender balance shows a 50 % or higher female share (variable for the different disciplines) except for professor positions. Most of the personnel are professors or associate professors (290/417), researchers are 127/417. Additionally, 360 PhD and postdoc are also part of the research staff.
All permanent academic staff at NTNU have a career plan. The faculty encourages establishment of research groups/units above a critical size (>4-5 full time equivalents). NTNU offers a leadership development program for research group leaders. NTNU acknowledges the need to improve research assessment and has signed the San Francisco Declaration on Research Assessment (DORA) and joined CoARA.

The faculty’s permanent research staff has both teaching and research activities included in their positions with teaching constituting 45 %, research 45 %, and administrative duties 10 %. NTNU has a common policy for sabbaticals which are regarded as an important tool for research quality improvement and internationalisation at NTNU.

The committee's evaluation

The organisation of research at the Faculty of Medicine and Health Sciences is well structured. The committee is pleased to note the synergies with St Olavs hospital. The research mobility opportunities for staff and PhD students are commendable. The Committee noted that weaknesses relate to the large size of some research groups and diversity of sub-groups and the domination of research output and funding by few sub-groups, specifically high-performing senior investigators.

The committee´s recommendations

- Consider whether reduction in or restructuring of several research groups and/or reduction of the number of thematic areas where the faculty wants to be strong, which can help overcome the weakness related to differences in size and quality of output.

- Conduct foresight studies to predict future healthcare needs based on demographic trends, guiding long-term research and planning efforts at the faculty.
- Given the integration with a leading hospital, prioritise research into managing patients with multiple chronic conditions, with a focus on developing comprehensive care models and intervention strategies.

1.3 Research funding

Over the last five-years (2018-2022), the Faculty of Medicine and Health Sciences has an average total basic income of approximately 1,214 MNOK (103 MEuro), of which 77% is dedicated to research. The internal R&D funding at the faculty are primarily used for research staff salaries and strategic PhD and postdoc positions. External R&D funding constitutes approximately 50 % of the annual faculty budget.

The committee's evaluation

The faculty has been successful in obtaining competitive national and international grants. It is commendable that external R&D funding constitutes approximately 50 % of the annual faculty budget.

The committee´s recommendations

- Increase participation in European research programs such as Horizon Europe, focusing on collaborative projects that address global health challenges and leverage NTNU's strengths.
- Diversify funding sources, i.e. seek funding from international philanthropic organisations and foundations that support health research, particularly in areas like aging, chronic disease, and global health.
- Explore public-private partnerships that align with NTNU's research priorities, securing additional funding while ensuring research addresses real-world challenges.

1.4 Use of infrastructures

The Faculty of Medicine and Health Sciences hosts core facilities and other large infrastructures, some of which are nodes of national infrastructures networks that receive funding from the Research Council of Norway: Core facilities for bioinformatics (BioCore), genomics (GCF), proteomics (PROMEC), MR imaging (MR Core) and cellular and molecular imaging (CMIC). Comparative Medicine (CoMed) and the 7-Tesla MRI centre are organized directly under the faculty.

Other infrastructures and core facilities are organised at the department level and are available to all researchers as well as external users. Several core facilities work closely with St. Olavs Hospital which ensures a clinical relevance for our infrastructures. RCN funding through the INFRA programme is vital for keeping the infrastructure up to date. The faculty also hosts the HUNT research centre, which contains a databank, biobank and HUNT Cloud which include cloud computing, data storage, data computation and data transfer. Processes are in place to avoid unnecessary duplication of infrastructures. The faculty participates in EMBL/EMBC, IARC, ELIXIR, BBMRI-ERIC, Euro-BioImaging-ERIC, ECRIN-ERIC, EATRIS-ERIC.

Various infrastructures assist researchers in managing data according to FAIR as part of their services. The university library has key roles by offering support services for research

data (Research Data @NTNU), assisting with data management plans and providing a data repository. All research published by NTNU researchers are archived in NTNUs repository.

The committee's evaluation

The research groups in the faculty make use of several national infrastructures listed in the Norwegian roadmap for research infrastructures and participate in European infrastructures. The Committee acknowledge that being associated with a national/European infrastructure can elevate the department's profile, attracting top talent, collaborators, and students. Core facilities have a clear plan for funding, they are partly funded by the university and the hospital, and by at least approximately 50% funded externally from the projects.

The committee´s recommendations

- Continue to support participation in infrastructures that facilitate collaboration with other institutions, leading to shared knowledge, joint research projects, and a broader network of experts. Being part of a national infrastructure can make a department eligible for specific grants and funding opportunities from national and international sources.

1.5 Collaboration

The Faculty of Medicine and Health Sciences has a close collaboration with St. Olavs university hospital. Together, the two organisations embody the integrated university hospital. There are approximately 370 employees in combined positions between the two organisations. Research infrastructure serving clinical research is managed primarily by the hospital, whereas infrastructure serving basic and translational research is managed by the faculty. All infrastructures can be used interchangeably by employees at both organisations. The faculty promotes interdisciplinarity and research collaboration and innovation in close collaboration with the health services.

There are also formal collaborations between the faculties within the NTNU and with the Norwegian faculties for medicine and health science of Oslo, Bergen and Tromsø and with Trondheim, Gjøvik and Ålesund municipalities. The main national collaborations are with St Olavs Hospital – Trondheim University Hospital, Nord University, Molde University College, Volda University College, faculties for medicine at the University of Oslo, Bergen and Tromsø. The main international collaborations are with Yale University, USA; Uppsala University, Sweden; Katmandu University, Nepal; Linköping University, Sweden. Other collaborations with different sectors, including public, private and third sector are with Norwegian Labour and Welfare Administration (NAV), Central Norway Regional Health Authority, Central Norway Regional Health Authority, SINTEF AS, Trondheim, Oppdal, Levanger, Gjøvik and Ålesund Municipalities; Nord Trøndelag and Møre & Romsdal Health trusts.

The committee's evaluation

The Committee is impressed by the extensive network of national and international, collaborators of the faculty and the research groups. The faculty also has agreements with several municipalities on health research collaboration.

The committee´s recommendations

- Map existing collaborations and identify gaps in strategic collaborations from a faculty-wide perspective and for the research groups.
- Develop and implement a strategy to address gaps in collaboration and to ensure fostering ongoing collaborations.
- Focus on establishing and maintaining collaborations with leading organisations recognised for their excellence.
- Form partnerships with international institutions that are also addressing healthcare challenges, enabling collaborative research that shares knowledge and resources.
- Forge strategic alliances with leading global universities and research institutions, facilitating student and faculty exchanges, joint research, and collaborative publications. Partner with global healthcare companies and technology firms to co-develop cutting-edge solutions, benefiting from shared resources and expertise.

1.6 Research staff

The profile of the academic staff/personnel at the Faculty of Medicine and Health Sciences includes teaching activities only, research activities only or any combination thereof. Many of the academic personnel from the merged university college health disciplines have teaching activities only. 76 % of the total academic staff at the faculty perform research activities. About 370 of faculty academic staff/personnel are employed in combined positions between the St. Olavs university hospital and the university. The proportion of total academic staff from the faculty's 8 departments range from 30% to 100%. The gender balance shows a 50 % or higher female share (variable for the different disciplines) except for professor positions.

The number of researchers, given in full-time equivalents (FTE), correspond to about 1000 people. Most of the personnel are professors or associate professors (290/417), researchers are 127/417. A large number of PhD and Postdoc positions are part of the research staff (360). Personnel with temporary positions (162 FTE) in the category professor, associate professor and researcher are employed in combined positions between St Olavs' university hospital and the faculty with a permanent position at the hospital, and thus are community-serving temporary employments. PhD positions (296 FTE) are temporary academic positions by regulation.

The committee's evaluation

From the interviews it emerged that there is no plan or prospect for further staff growth. It is of concern that the departments find it particularly challenging to recruit PhD students because of financial challenges.

The committee´s recommendations

- Significantly reduce the number of temporary posts, especially at the junior level (researchers, scientific assistants) and administrative posts, giving job security, supporting retainment of staff and generating an inclusive culture where people feel a sense of belonging.
- Improve gender parity at post-doc, and Full Professor level.
- Support career development of female early career researchers and their transition into faculty posts. Targeted support and mentoring should be given to ensure female early

career researchers (researchers, post-doc, Assistant Professors) can reach their full potential, achieving promotion into Associate Professor and Full Professor positions.
- Foster the career development of the next generation of researchers – Master and PhD students, post-docs.
- Continue to support robust mentorship programs for early-career researchers, offering guidance on career development, grant writing, and research excellence. Create global fellowship programs that allow researchers to spend time at leading international institutions, enhancing their expertise and global network.

1.7 Open Science

NTNU is through its Policy, Guideline and Development Plan for Open Science committed to making research and education as open as possible. The University Library has been given a key role in implementing NTNU's plans for Open Science. All scientific publications made by NTNU employees must be open access, either through publishing in open access journals (gold open access) or through self-archiving (green open access) in the institutional repository – NTNU Open. Research data, software, code and tools produced/created by NTNU employees are available to the public under an appropriate license if there are no legal or ethical constraints. Research data are collected with proper data management to ensure FAIR data that can be reused and that makes science transparent. Software, code and tools created by NTNU employees should be open-source and made available through an appropriate repository. NTNU's policy for Open Science does not address citizen science.

The researchers at the faculty contribute toward open access to science by publishing in open access journals when available and suitable to make data available according to FAIR principles.

As a general rule, NTNU owns all results that have been created through the use of the university's resources. Research data produced at NTNU are curated and archived in alignment with international standards and principles and all research projects should have a data management plan that at minimum contains the core elements defined by Science Europe to safeguard these principles.

The committee's evaluation

The committee is pleased that the faculty has open access publishing policies and support the adoption of FAIR principles for data. Engagement with open science seems focused on open access publishing and does not address other pillars.

The committee´s recommendations

- Continue to support open access publications.
- Develop and implement policies and strategies and make available resources to enable researchers to engage with all pillars of open science, aligned with state-of-the art open science approaches.
- Develop and implement policies and strategies and make available resources to monitor that open science (all pillars) becomes the new normal.

2. Research production, quality and integrity

Introduction

Research activities span the entire value chain from basic research to research to innovation. The scientific focus areas of the research conducted at The Faculty of Medicine and Health Sciences with the highest publication volume by the strongest research groups are: 1) Public, Environmental and Occupational Health; 2) Neurology; 3) Biomedicine; 4) Nursing; 5) Multidisciplinary natural sciences; and 6) General medicine. The share of publications with gold open access has increased during the period, but there still is need of improvement to reach our goal of 100% open access. The normalised citation score shows that the faculty's scientific publications have been cited above the world average (=100) during the period 2013-2021. Six of the ten best percentile value papers originate from two strong groups. St Olavs hospital is the top co-authoring institution. NTNU works actively to maintain integrity in research projects. Health research projects are compliant with GDPR. Moreover, the faculty has invested in the development of a secure infrastructure for sensitive data: HUNT Cloud. The faculty carries out yearly revisions of 10% of all health research projects to ensure that projects are implemented according to relevant laws and regulations. Any reports of suspected misconduct or breach of norms are, as a rule, handled at the department level. The faculty administration supports the departments when necessary. If conflicts cannot be settled at the faculty level the cases are reported to the Research Ethics Committee at NTNU.

2.1 Research quality and integrity

This part includes one overall evaluation of each research group that the administrative unit has registered for the evaluation. The overall assessment of the research group has been written by one of the 18 expert panels that have evaluated the registered research groups in EVALMEDHELSE. The expert panels are solely behind the evaluation of the research group(s). The evaluation committee is not responsible for the assessment of the research group(s).

Research Group: Anaesthesia and Emergency Medicine

Based on the available moderate resources, the research group's research activities are comprehensive and significant, mainly driven by key persons within each subgroup, which all have managed to initiate and develop research on national and to some extent international level within their field. Points of improvement are a more formalised structure and more dedicated time from leadership, research infrastructure support and user involvement.

Research Group: Research group for cancer and palliative care

The main strength of this group is the ability to carry out and publish good quality interventional trials contributing to shape the standard of care in small cell lung cancer and in symptoms control/palliative care, mostly done on a basis of a collaboration with other national groups having a leadership role. To make this sustainable, it may be critical that they open themselves for a more international network of cooperation. Eight out of the nine projects reported are clinical trials, mostly led by them. There is only one translational type of project aiming at improving the classification of small cell lung cancer with samples they got form the different trials they have carried out. They co-author two international

guidelines on cachexia, but their scientific input in the palliative field is of moderate interest. Weaknesses are: a. Limited international cooperation, b. Scarcity of translational research, even though they claim to be part of a national network of biobanks and a genomic core facility included on the Norwegian Roadmap for Research, and c. Lack of international funding.

Research Group: Centre for Care research

The Centre for Care Research (CCR) operates in a field highly relevant to society, especially given demographic changes and the increasing demand for care services. This relevance ensures that CCR's work addresses pressing societal needs, enhancing its impact and visibility. CCR has extensive experience in conducting practice-based research and established collaborations with municipalities. This expertise provides a strong foundation for contributing to the development of a new knowledge system for municipalities, particularly through understanding local challenges and co-creating relevant projects. With a network covering all of Norway and well-established collaborations nationally and internationally, CCR is well-positioned for large-scale national projects and continued expertise development. This network facilitates knowledge exchange and the generation of new project ideas, enhancing CCR's research capacity and impact. The relatively new field of care services research presents challenges in identity building and theory development for CCR. Balancing the demands of collaboration with municipalities and theory building can be challenging, potentially limiting the depth of theoretical contributions. CCR faces the challenge of balancing the need for quick responses and rapid deliverables with the slower processes of proposal development, scientific writing, and theory development. This tension between speed and depth may affect the quality and depth of CCR's research outputs. As an externally funded research group, CCR is subject to changes in base funding, which may influence its activities. Additionally, increased competition for external funding in the healthcare research sector poses a challenge. The inability to offer permanent positions also hinders the recruitment and retention of talent, potentially impacting the continuity and strength of the research centre. CCR has made significant contributions to addressing societal needs in the field of care services through its practice-based research, collaborations with municipalities, and national and international networking. While facing challenges such as identity building, funding dependency, and balancing speed with depth, CCR continues to play a vital role in generating relevant knowledge and driving practice development in the care services sector. With its strong foundation and collaborative approach, CCR is well-positioned to further advance research and innovation in this critical area.

Research Group: Centre for Excellence in Molecular Inflammation Research (CEMIR)

This is a large well-defined research group consisting of 53 scientific staff members with an excellent research organisation and strategy. The research group’s vision and organisation are well suited to deliver outstanding research with international recognition, to collaborate with international leading scientists, and an exceptional environment to train the next generation of scientists. Benchmarks are relevant and being achieved. The research group has an excellent track record of attracting external funding and is particularly well supported by the host institution and the RCN. The scientific quality of the research group is superb. The research group conducts groundbreaking research with a clear contribution to improving scientific knowledge related to molecular mechanisms of inflammation.

Research Group: Circuits and Plasticity

The Circuits and Plasticity group within the Kavli Institute at the NTNU is a well-established and relatively large group of 46 staff including seven PIs, six with permanent Professorial positions. Collectively, they are performing high quality and impactful research at the forefront of the field of brain science, especially the cortex, exploring neural processes and cognitive function. The group is well organised and the provision of fora for the dissemination of information within (weekly) and between (bi-weekly) the individual labs, supplemented by international guest speakers, is exemplary in terms of providing support and training for early career stage scientists. The group has attracted significant external competitive funding and transformed this into research outputs of a high volume and quality, thereby demonstrating excellent value for money and enhancing the future sustainability of the group. The panel was impressed overall by the Circuits and Plasticity group's research accomplishments and is optimistic about its prospects for the next decade. The only relative weaknesses detected in the self-assessment were in the societal contributions section, where there was considerable scope for achieving more, and in aspects of how the document this was presented. Finally, the panel recommends an improved articulation and better integration of the zebrafish and mammalian cortex strands of research, which would allow the group to extract the maximum possible benefits that the two systems have to offer each other.

Research Group: Exercise, circulation and respiration

The exercise, circulation and respiration research group has strengths in producing outstanding, high-quality research and publications, with significant research income generated from competitive national and international funding sources. The weaknesses relate to 1) their large size (93 individuals) and diversity of sub-groups; 2) domination of research output and funding by one or two sub-groups and specifically two high-performing senior investigators; 3) difficulty to delineate the contribution and outputs of the other investigators and their affiliation to which sub-group; 4) a high proportion of individuals in temporary positions; 5) 50% have a combined position between the hospital and the university; 6) limited innovation considering the size of the group. Altogether, these markedly impact the development and implementation of a clear strategic plan and vision, legacy planning and capacity building, career development of early career researchers, innovation, the working culture, staff retainment and collegiality. It should be noted that it was difficult to evaluate a group of this size, and the self-assessment was insufficiently completed; the text was in bullet point form and some sections (strategy, funding portfolio) were incomplete.

Research Group: Geriatrics, Movement and Stroke (GeMS)

GeMS produces good quality work. There are some organisational concerns related to the allocation of time and the sustainability of the group long term. In addition, there are concerns about the relatively wide spectrum of research areas in relation to the number of senior researchers in the group. There is no explicit report of mentorship schemes to support early career researchers. Similarly, there is no clear indication of user involvement in the projects.

Research Group: Implementing Actions for Health Equity and Social Sustainability (IMPACTS)

While the quality of the recent research outputs of the IMPACTS group is perceived by the panel as nationally strong and sufficient to achieve some international recognition, the quality of the organisational environment and the group's contributions to the research process from the formulation of overarching research goals and aims via research activities to the preparation of the publication have been relatively modest. Involvement of societal partners in the research process is a clear strength of the research group, with very good potential for continuing strong societal impacts, particularly in the area of population health.

Research Group: Integrative Neuroscience

The Integrative Neuroscience Group is a small but important group, conducting interdisciplinary research covering aspects from in vitro and computational models to clinical translation. The group has made significant strides in its field, with national and international collaborations. The group is adept at maximising its resources and is focused on high-impact publications and overcoming recruitment challenges for clinical studies through regional collaborations. However, the group heavily relies on Norwegian funding, which presents a risk.

Research Group: K.G Jebsen Centre for Genetic Epidemiology

The group is very important to the host institution and to the scientific community in Norway. The 10 submitted publications are highly significant with many citations. They score highly on originality, rigour and significance. Many studies use combinations of several large datasets, demonstrating exceptional statistical rigour. Several of the group's own papers are published in internationally leading journals, but it is difficult to ascertain the exact roles of the authors in the group. The group has a very strong international profile and is a key player in the research infrastructure. The group's self-assessment is brief and difficult to evaluate. However, the group's use of high-quality data sources and biobanks clearly contributes to societal improvement and clinical guidelines. Some of its researchers contribute to various Norwegian governmental boards and scientific societies, as well as to guideline development. There is little information on user involvement.

Research Group: MR Unit

This is an outstanding research group focusing on developing and implementing new tools for precision diagnostics and medicine, mainly in the field of oncological and neurological diseases, but also with a significant contribution to our current understanding of the normal aging of the brain using MRI, PET and multi-omics technologies. By combining multiple disciplines from different academic background including technical and medical faculties with coworkers at all academic levels, the research group has been able to establish collaborations within the hospital sector as well as academically and to some extent with industry, both nationally and internationally. With 1/3 of the academic positions being professors, the organisation of the research group is somewhat top-heavy, which needs to be considered when making the transition to the next generation of academics. The gender equality is, however, impressive with 40-50% women for most levels of academic positions. The group holds significant research funding from both national and international funding agencies enabling high output of both science and scientist by promoting academic careers through extensive educational activities.

Research Group: Muscoloskeletal Research group (MSK-RG)

The Musculoskeletal Research Group (MSK-RG) group was founded in 2012. The group has expanded over the years to now include 14 members. There is an impressive membership across disciplines which spans basic science, health care, technology and particular research specialisms such as statistics. The group has a professorial lead, supported by 3 other professors. There are regular meetings and opportunities to develop and showcase research. The educational pipeline in terms of Master's and PhD students is sound. The group aligns well with the strategic goals of its administrative unit. The mission is to conduct research on 'risk factors, early prevention and improving healthcare' for those with unspecific MSK pain. There is a strong focus on science and technology as an important benchmark related to the group's strategy. This specific focus has enabled the group to build competency in AI, and to integrate new technologies into healthcare systems to achieve direct patient benefits. MSK-RG has robust international links that facilitate the active exchange of researchers and students. This has potential for further development as has the potential to secure additional international funding. There is, however, a need to articulate user involvement more explicitly. There are challenges outlined but many of these are common across all research groups, including recruitment and retention of staff and continued research funding. However, the MSK-RG group would seem to be well placed to address this through continued international and national funding streams and through industry links and expertise in technology. There are also challenges identified in data storage but again the geographical position of this group in this university would seem to suggest it might be better placed than others facing similar challenges. Overall, the group needs to continue on their current trajectory as it is making solid progress and has potential to do even better.

Research Group: Norwegian Centre for Headache Research (NorHead)

The organisational environment is adequate for supporting the production of excellent research. The research group has published in international journals with the most rigorous standards. The quality of the research is internationally excellent with an outstanding role of the research group in the research process. The first dimension of societal impact scores high because of the societal and cultural impact this unit has on the formation of resources and care of patients.

Research Group: NTNU Low Birth Weight in a lifetime perspective

The research group presents a wide set of positive achievements: interdisciplinarity between the group components, project-based leadership, active recruitment and education of promising young scientists, good integration with the host institution, collaboration with appropriate interdisciplinary research partners at the national and international level, ambitious development of new concepts and methodological approaches, capability of translating discoveries into innovative products, conceptualisation of sound research projects yielding high level scientific publications.

Research Group: Registry research for the health care services

The REGFORSK research group is a young, however, very promising, research group that addresses research question of important to public health in Norway and elsewhere. The research group takes advantage of the unique resources for real-life evidence that lies in the Norwegian registers and the HUNT-cohort, and the efficient data infrastructure that has

been built up at NTNU. The research group produces very high-quality research that addresses important public health questions and strives to be at the forefront of methodological development in health services research and epidemiology. To fulfil this goal, the research group may profit from stronger international collaboration, including seeking grants from international funding aiming to conduct research projects which use a multidisciplinary approach based on the excellent data infrastructure available for REGFORSK, which could contribute to solve some of the globally burning health issues.

Research Group: Regional Centre for Child and Youth (RKBU)

This is a large, active and impactful research group (the Regional Centre for Child and Youth Mental Health and Child Welfare – RKBU) meeting faculty and NTNU objectives by creating and providing knowledge or evidence to practitioners and services to enable them to improve the mental health and wellbeing of children and young people. The research group is multi-disciplinary including colleagues researching information technology and those studying education. It receives core funding from the Norwegian Directorates of Health and of Children, Youth and Family Affairs as well as substantial core university funding. It attracts relatively small but growing amounts of other external funding, for example from the Research Council of Norway and from health services, but no international funding. Members of the research group work with services, especially regionally based, and practitioners. This work is reported to be aided by co-location at a University Clinic and some shared or joint research/practice appointments. The outputs listed include some in respected journals and are of high quality; others reflect the more preparatory stage of a large study. Its research and knowledge translational activities reflect the ambitions outlined in the Centre's benchmarking self-assessment. This self-assessment report highlights its contributions to practice learning and interventions in the section on its societal impact, and to evidence underpinning policy guidelines with examples of research impacting on services and practice thinking. Most prominently these are in relation to the increased attention to the 'settling in' period for young children in kindergarens and new knowledge about the prevalence of mental ill health among many children living in residential homes. There is mention of service user involvement but this might be more embedded into the work of the Centre. There may also be substantial opportunities for the Centre staff to engage in research on knowledge translation or to evaluate the approaches taken in its knowledge translation work and how this is implemented and used in practice. Such research is increasingly prominent internationally and would seem to lend itself to the greater engagement by the Centre with international comparators in the 'evidence to practice' subject area. The Centre provides an insightful analysis of its current position, ambitions, and the need to address certain challenges. It might also address some of the implications of diversity for its own research translational practices. The self-assessment document did not address the Centre's contribution to the PhD or Master's programmes so the panel was unable to comment on this area of capacity building but would encourage the Centre to outline its contributions currently as well as for the future. Compared to other national groups submitting to this panel this Centre is unique in its emphasis on conducting research and its engagement in practice development. The panel was of the view that this compares well to other such Centres internationally in the quality of its work but suggested that the Centre could consider joining with international research teams in developing methods to evidence the effectiveness of such work.

Research Group: Sensory and Motor Systems

The Sensory and Motor Systems (SMS) group excels in the majority of the areas of this assessment and is achieving their main goals and benchmarks nationally and internationally. The research strengths of the group are recognised by the panel, and they are evident in terms of high quality, high impact research outputs in top ranking journals, along with an impressive portfolio of research grant funding from diverse sources. The group makes important contributions to the host institution in terms of postgraduate teaching and administration and in return this group receives good institutional support. There is also evidence of some excellent societal contributions both in terms of public engagement and also in, for example, the development of prosthetic devices and AI-derived analytical tools that characterise normal behaviour, with the potential to be used in early diagnosis of motor disorders such as ALS. There are no significant weaknesses in the activities and outputs of the SMS group and therefore there is cause to be optimistic about their future. However, the very small size of the group, coupled with the vagaries of future funding, could negatively impact its long-term sustainability by presenting a risk of becoming chronically underfunded. The group as it stands could be viewed as a kernel of excellence upon which to expand in the future and there is a perceived need to build strength in depth.

Research Group: Space, time and memory

The Space, Time and Memory research group has repeatedly demonstrated its capacity to produce world leading research in their field for more than two decades and has continued to attract generous and stable funding. During this process they have contributed to researcher training, the development of cutting-edge imaging technologies for brain research, and played a key role in establishing the NORBRAIN infrastructure hub, serving neuroscience researchers in Norway. The research group considers itself to be on solid ground based on generous funding but lists challenges to recruitment of talents as its largest threat. The reported contribution to health and user involvement is not sufficiently elaborated in the self-assessment report and thus difficult to assess.

Research Group: The ultrasound research group (USGR)

This is an excellent research group, active in the field of ultrasound applied in cardiovascular research, with great ability to attract research funding and turn new knowledge into clinically useful innovations. By advancing ultrasound technology through multidisciplinary research, education, and innovation, the group has been able to establish a solid research foundation for both engineering and medical scientists. The group is responsible for development of new ultrasound techniques that has reached clinical implementation around the world though close collaboration with industry and establishment of spin-off company. This has generated several patents as well as commercially and freely ava ilable software for post-processing of ultrasound images. The group could benefit from taking lead in international consortia and heading larger international grants, such as larger EU grants. Furthermore, the group would benefit from a clearer benchmark strategy, both within the institution, on a national level and internationally. The potential is there on all accounts.

Research Group: Trøndelag Health Study (HUNT)

The HUNT Research Group has built, and maintains, exceptional research data and an incredibly strong infrastructure. These are internationally important in population-based health research. The HUNT research strategy focuses on the development of these

resources and promotion of their use. Whilst that is incredibly important it is not really a plan of research for the group and, if the group aims to deliver its own research outputs rather than support others studies, this could be expanded upon. There is also a lack of clarity as to how this HUNT group relates to others involved in the study and. The group is operating at a national level in terms of research outputs but its data, and the infrastructure they have creates around it, are at an international level.

Research Group: Unit of Laboratory Medicine

The research group presents a wide set of positive achievements: interdisciplinarity between the group components, project-based leadership, active recruitment and education of promising young scientists, good integration with the host institution, collaboration with appropriate interdisciplinary research partners at the national and international level, ambitious development of new concepts and methodological approaches, capability of translating discoveries into innovative products, conceptualisation of sound research projects yielding high level scientific publications.

Research Group: Women´s health and PCOS

Strengths: Global leaders in PCOS-related research, life course approach to PCOS combining expertise in epidemiology and basic science, excellent funding portfolio and publication record, contribution to national and global guidelines, good engagement with consumers and has dissemination strategy, and likely to have societal impact through education, economic development, and cultural development in Norway and internationally. Weaknesses and challenges: There is a lack of clear succession plan for the group lead, as the current lead is approaching retirement. Paucity of postdoc and researcher positions limits career progression after PhD. The team struggles with post-award administrative support, and manpower to undertake the clinical trials. They had to abandon recruitment to a study despite obtaining large funding. Transitional arrangements after retirement not clear.

The committee´s comment to the assessment of the research group(s).

The expert panels' evaluations of the research groups highlight key strengths and weaknesses across the research groups. Overall, the scientific focus of the research groups is well aligned with the focus and aim of the research of the administrative unit. The assessment underscores that strength is related to the synergies of research groups with St Olavs hospital and several municipalities on health research collaboration, the high quality of research, the extensive network of national and international, collaborators; the use of several national infrastructures and the participation in European infrastructures that elevate the department's profile, attracting top talent, collaborators, and students.

The assessment also underscores the weaknesses of research groups relate to the large size of some research groups and diversity of sub-groups, the domination of research output and funding by few sub-groups and specifically high-performing senior investigators, the inability to offer permanent positions that hinders the recruitment and retention of talent, potentially impacting the continuity and strength of the research.

3. Diversity and equality

NTNU has a policy and action plan on gender equality and diversity, in line with Norwegian legislation and regulations for Higher Educational Institutions. Policy and practices are closely linked to NTNU's mission and vision of "Knowledge for a better world" which is best created in an organisation with equal opportunity, diversity and gender balance. The faculty has a devoted group who coordinates work and efforts to achieve better gender balance, inclusion and diversity.

The committee's evaluation

NTNU has policy against discrimination characterised by an equality-diversity-inclusive work culture that makes the faculty an attractive workplace. It is not explicitly mentioned whether the policies and actions pertain to staff as well as students. From the interview it emerged that every two years a Working Environment Survey is carried out which is very important for examining these issues in depth.

The committee´s recommendations

- Clarify that the NTNU equality action plan and the faculty's related policies and actions pertain to all staff as well as students.
- Continue to periodically monitor staff and students' experiences regarding unequal treatment, discrimination or other forms of inappropriate behaviour; and to follow up and to develop preventive measures.

4. Relevance to institutional and sectorial purposes

The sector-specific overarching goal of high relevance for the Faculty of Medicine and Health Sciences is striving for high quality in research and education. All activities at the faculty are focused at achieving this sector specific objective. Quality reports are prepared for educational activities, and this puts focus on where the faculty stand within different areas, where the faculty is strong and which areas need special focus and improvements. An important task for the administration, at faculty and department levels, is to support research groups with different levels of maturity and ambitions and to inform and make it convenient for the researchers to follow institutional guidelines and policies regarding open science, internationalisation, publications, and dissemination. In addition, administrative support for grant application and project design and management is directed towards early career researchers and research groups who are taking the step up from internal funding to apply for external funding. The UN Sustainable Development Goals (SDGs) have also been closely integrated in the NTNU and faculty strategies from 2018.

Innovation has been a priority area for NTNU during the last decade. The pro-rector for innovation works strategically to strengthen and coordinate innovation across all faculties. This structure is mirrored at the faculty with a Vice-dean for innovation. The NTNU Technology Transfer Office is the main point of contact and resource for innovation and commercialisation projects at NTNU.

The motivation varies greatly between research groups at the faculty. Some research groups are very active and have several ongoing innovation projects and commercialisation activities, other research groups have yet to unlock their innovation potential. How easily the research translates to innovation and commercialisation activities varies both within the field of research and the research group. Increasing the motivation for innovation activities has been a priority on all levels of the NTNU organisation the last few years.

NTNU has developed policies for innovation including IP policies, new patents, licenses, start-up/spin-off guideline. The administrative unit has dedicated personnel for innovation support. The NTNU technology transfer office handles the commercialisation of projects and IPR, they are the main supporters of innovation and commercialisation projects once they have moved passed the idea stage. NTNU has developed policies for innovation including IP policies, new patents, licenses, start-up/spin-off guidelines. Successful innovation and commercialisation results are listed and described in the self-assessment document.

The committee's evaluation

The interview revealed that there is a Student Innovation Centre not only for healthcare professionals, but for all students in technology disciplines as well. However, most researchers do not consider innovation to be their job. So, it is necessary to educate people.

The committee´s recommendations

- Increase awareness and motivation across the faculty staff and generate a culture of innovation, a regular contact for exchange between the academic staff, the technology transfer offices and industry would be beneficial.

- Establish labs and incubators within the faculty dedicated to health innovation, encouraging the development of startups and spin-offs in healthcare technology. Offer programs that combine medical research with entrepreneurship, preparing students and researchers to commercialise their innovations.
- Conduct longitudinal studies tracking health outcomes over time, providing valuable data for understanding the impact of lifestyle, environment, and genetics on health.
- Leverage NTNU's access to biobanks for biomarker research, identifying predispositions to diseases and tailoring public health interventions.
- Participate in international research consortia that tackle pressing health issues, fostering global partnerships and increasing access to funding.

4.1 Higher education institutions

In Norway all education at Higher education institutions is research-based. This is especially important for master and PhD levels. To complete a master's degree or PhD, the candidate must complete courses with guided research work. Many instructors with research positions and combined roles with St. Olavs hospital are involved as teachers at the professional program in medicine. This ensures a research foundation for teaching and guidance on the students' research topics. The Medical Student Research Program (MSRP) is an optional program for medical students at the faculty to complete about 50 % of a PhD during their time as an undergraduate medical student. The faculty use strategic funds for awarding 12 short-time PhD positions to Medical Student Research Program candidates to complete their PhD every year.

All master students are involved in research as an integrated part of their study program and are a valuable source for the recruitment of talented researchers to PhD positions. It is most common for students to get a master's thesis project as a small part of a larger research project that the department already established.

The committee's evaluation

The Committee positively commend the faculty for the commitment to ensuring that teaching and supervision in the master's and PhD programmes is research-based. The Committee also commends the Medical Student Research Program with strategic funds for awarding 12 short-time PhD positions every year.

The committee´s recommendations

- Develop strategies for training the future healthcare workforce that is equipped to handle the challenges posed by an aging population and increasing demand for primary care.
- Create programs for continuing education that keep primary healthcare providers updated on the latest research, technologies, and care models.
- Provide continuing education opportunities for healthcare professionals, focusing on emerging trends, technologies, and best practices in medicine and healthcare. Offer leadership programs for healthcare researchers and practitioners, preparing them to lead complex health systems and large-scale research initiatives.
- Develop interdisciplinary graduate programs that combine medicine, engineering, and data science, preparing students for careers at the intersection of these fields.
- Ensure all students have an opportunity and are encouraged to join a research group and that any criteria and procedures to join are clear and transparent. Furthermore, that students who do not join a research group benefit from equal support and resources.

5. Relevance to society

Introduction

Research groups under the Faculty of Medicine and Health Sciences have made major contributions to the society during the last ten years. Most of the contributions can of course be attributed to the researchers themselves, but the researchers also acknowledge the contributions of the administrative unit for their success.

Notable achievements include:

- The Kavli groups are continuously making ground-breaking discoveries within neuroscience, thanks to the administrative support from the faculty, state-of-the-art research infrastructures (animal facilities and 7T MRI), as well as proximity to the university hospital for translational research opportunities within Alzheimer disease and other neurodegenerative disorders and proximity to the technological faculties for mathematical modelling of neuronal circuits.
- The development of the Covid-19 test during the pandemic is a particular good example on the importance of research groups focusing on basic research and on the administrative support provided by the faculty.
- The HUNT population study with data and high-quality biological samples collected over four decades has not been possible without major support from the faculty. This research infrastructure and data/specimen collection has led to major discoveries leading to great societal impact through a number of guidelines and advice to the public regarding health.

The committee´s comments on impact case 1 - Nucleic acid extraction – Covid diagnostics for a nation

The research has highlighted the importance of long-lasting expertise in basic research for the timely development of diagnostic test for Covid-19 also thanks to a cross disciplinary collaboration at NTNU. This test was the most used extraction test for PCR based corona diagnostics in Norway. The expertise and technology in the research group on nucleic acid extraction and detection, and implementation on advanced liquid handling systems combined with microbial and viral diagnostics expertise was essential for this innovation. Fundamental was also the proximity to the competent research environments of the Department of chemical engineering at NTNU and the proximity to St Olavs University Hospital in Trondheim. Six papers by the research group published in international journals are listed. The NTNU corona test had an enormous impact on the test capacity, monitoring and controlling infection spread in the Norwegian society during the pandemic. This impact case clearly demonstrates how strong and robust basic research teams have a unique potential for innovation which is of particular importance for preparedness.

The committee´s comments on impact case 2 - High-dose, twice-daily thoracic radiotherapy prolongs survival in limited stage small cell lung cancer (SCLC)

SCLC is the most aggressive lung cancer and causes 4% of cancer deaths. Treatment for limited stage SCLC is concurrent chemo- and radiotherapy. The faculty’s research group(s) was the first to show that Twice-daily (BID) thoracic radiotherapy (TRT) is more effective than hypofractionated TRT and does not cause more toxicity. Subsequent implementation of BID TRT in Norway led to improved survival: high-dose BID TRT almost doubles survival

time and 40% more patients are cured. This is the first positive randomised trial in this setting for >25 years. Impact evaluation has been performed using data from the Norwegian Cancer Registry.

Six papers by the research group published in international journals are listed. Lung cancer is one of the areas in oncology in which most progress has been seen the last decades, but unfortunately, not much improvement has been seen for SCLC and the prognosis for these patients have been unchanged. Thus, the research activity addresses large unmet needs and has resulted in a most welcome treatment improvement for a largely neglected subgroup of patients with cancer.

The committee´s comments on impact case 3 - SelfBac

SELFBACK is an artificial intelligence-based decision support system that provide evidence-based and individually tailored self-management recommendations for people with low back pain. The recommendations for self-management are delivered via a smartphone app. The SelfBack app is currently available in nine languages (Norwegian, Danish, Swedish, English, German, Dutch, French Spanish and Arabic). SELFBACK was developed in the frame of a project funded by the European Union Horizon 2020 Research & Innovation Action programme, bringing together seven partners from Norway, Denmark, Scotland and the Netherlands. The SELFBACK system was registered as a Medical Device Class 1 under the Medical Device Directive in the European Database on Medical Devices. It has been licenced by the NTNU Technology Transfer Office (TTO) to SelfBack Aps, a Danish company that has commercialised the SELFBACK system. Approval for implementing the app in clinical practice in the National Health Service in England has been obtained. Ten papers by the research group published in international journals are listed.

The committee´s comments on impact case 4 - Obstructive lung disease

Lung function measurement as spirometry is pivotal for diagnosis and follow-up of obstructive lung diseases like chronic obstructive pulmonary disease (COPD) and asthma. Different reference values for spirometry and cut-offs for normality have been used for different regions, age groups and levels of health care. The **f**aculty research group(s) improved the interpretation of spirometry which is pivotal for diagnoses of obstructive lung disease and developed reference values to fit Norwegians using combined spirometry data from Hordaland Study, the Tromsø Study and HUNT. Based on research group own research as well as national and international collaboration national guidelines have been developed. These are not revolutionary but are the first national guidelines to accept and implement strategies for interpretation of spirometry recommended by international lung physiologists and clinicians. The results of the research have been included in the National Guidelines for COPD 2022 by the Norwegian Health Directorate, the report from the National Public Health 2022, relevant chapters in the new Norwegian Textbook for General Practice and the Norwegian Electronic Handbook for Medical doctors, which is used by 90% of GPs in Norway and is translated into Swedish and Danish. There have also been publications in the Journal of the Norwegian Medical Association and Utposten, a journal for general practice.

The committee´s comments on impact case 5 - Adapt – Patient Adaptive Imaging in Echocardiography

In a collaboration project between NTNU, St. Olavs hospital and GE Vingmed Ultrasound, and GE HealthCare under the aegis of the SFI Center for Innovative Ultrasound Solutions (CIUS), a new technology (Adapt) has been developed capable of adapting the image processing of ultrasound images to the individual anatomy of the patient. The core of the technology is an algorithm that is capable of estimating and compensate for the effect of aberration. This allows the ultrasound system to adapt its image processing to each individual patient. In a pilot clinical trial encompassing 22 patients recruited from the Clinic of Cardiology at St. Olavs hospital, image quality was demonstrated to be significantly improved in standard echocardiography using Adapt. Six references are listed.

NTNU has a commercial license agreement with GE HealthCare about the use of Adapt. Significant improvement in image quality have been demonstrated and the technology is now commercialised globally. GE HealthCare is a global market leader (40% of the market) of cardiovascular ultrasound and estimates that more than 250 million echocardiographic exams are carried out world-wide every year. With Adapt now released on the Vivid E95 system from GE with their global reach, this technology will enable improved image quality for millions of patients in the years to come. GE Vingmed systems are used to scan more than 300.000 patients per day on a global basis, indicating the potential impact of the innovation.

Appendices

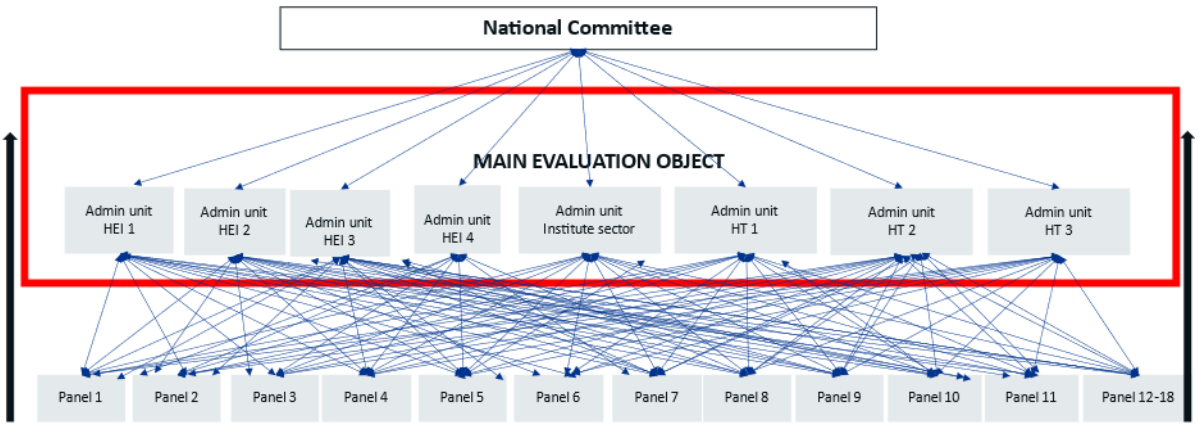
Evaluation of Medicine and health 2023-2024

By evaluating Norwegian research and higher education we aim to enhance the quality, relevance, and efficiency. In accordance with the statutes of the Research Council of Norway (RCN), the RCN evaluates Norwegian professional environments to create a solid and up-to-date knowledge base about Norwegian research and higher education in an international perspective.

The evaluation of life sciences is conducted in 2022-2024. The evaluation of medicine takes place in 2023-2024. The evaluation of biosciences was carried out in 2022-2023. The primary aim of the evaluation of life sciences is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), the institute sector and the health trusts. The evaluation shall result in recommendations to the institutions, the RCN and the ministries.

Evaluation of medicine and health (EVALMEDHELSE) 2023-2024
The evaluation of medicine and health includes sixty-eight administrative units (e.g., faculty, department, institution, center, division) which are assessed by evaluation committees according to sectorial affiliation and other relevant similarities between the units. The administrative units enrolled their research groups (315) to eighteen expert panels organised by research subjects or themes and assessed across institutions and sectors.

Organisation of evaluation of medicine and health 2023-2024



The institutions have been allowed to adapt the evaluation mandate (Terms of Reference) to their own strategic goals. This is to ensure that the results of the evaluation will be useful for the institution's own strategic development. The administrative unit together with the research group(s) selects an appropriate benchmark for each of the research group(s).

The Research Council of Norway has commissioned an external evaluation secretariat at Technopolis Group for the implementation of the evaluation process.

Each institution/administrative unit is responsible for following up the recommendations that apply to their own institution/administrative unit. The Research Council will use the results from the evaluation in the development of funding instruments and as a basis for advice to the Government.

The web page for the evaluation of medicine and health 2023-2024: [Evaluation of medicine and health sciences (forskningsradet.no)]

Forskningsrådet

Se vedlagte adresseliste

Vår saksbehandler / tlf.	Vår ref.	Deres ref.	Sted
Hilde G. Nielsen/40922260	23/3056	[Ref.]	Lysaker 28.4.2023

Invitasjon til å delta i fagevaluering av medisin og helsefag (EVALMEDHELSE) 2023-2024

Vi viser til varsel om oppstart av nye evalueringer sendt institusjonenes ledelse 9. november 2021 (vedlegg 2).

Porteføljestyret for livsvitenskap har vedtatt å gjennomføre fagevaluering av livsvitenskap 2022-2024 som to evalueringer:

- Evaluering av biovitenskap (EVALBIOVIT) (2022-2023)
- Evaluering av medisin og helsefag (EVALMEDHELSE) (2023-2024)

Hovedmålet med fagevalueringen av livsvitenskap 2022-2024 er å vurdere kvalitet og rammebetingelser for livsvitenskapelig forskning i Norge, samt forskningens relevans for sentrale samfunnsområder. Evalueringen skal resultere i anbefalinger til institusjonene, til Forskningsrådet og til departementene. Den forrige fagevalueringen av biologi, medisin og helsefag ble gjennomført i 2010/2011 (vedlegg 3).

Fagevaluering av livsvitenskap retter seg mot UH-sektor, helseforetak og instituttsektor (vedlegg 4). Forskningsrådet forventer at aktuelle forskningsmiljøer deltar i evalueringene, selv om beslutning om deltagelse gjøres ved den enkelte institusjon. Videre ber vi om at deltakende institusjoner setter av tilstrekkelig med ressurser til å delta i evalueringsprosessen, og at institusjonen oppnevner minst én representant som kontaktperson for Forskningsrådet.

Invitasjon til å delta i fagevaluering av medisin og helsefag (2023-2024)

Fagevaluering av medisin og helsefag er organisert over to nivåer (vedlegg 4, side 11). Internasjonale ekspertpaneler vil evaluere forskergrupper på tvers av fag, disiplin og forskningssektorer (UH, institutt og helseforetak) etter kriteriene beskrevet i kapittel 2 i evalueringsprotokollen (vedlegg 4).

Panelrapporten(e) for forskergruppene vil inngå i bakgrunnsdokumentasjonen til forskergruppen(e)s administrative enhet (hovedevalueringsobjektet i evaluering), og som vil bli evaluert i internasjonale

sektorspesifikke evalueringskomiteer. Evalueringskriteriene for administrative enheter er beskrevet i kapittel 2 i evalueringsprotokollen (vedlegg 4).

Innmelding av administrative enheter og forskergrupper – frist 6. juni 2023

Administrative enheter (hovedevalueringsobjektet i evalueringen) – skjema 1

Forskningsrådet inviterer institusjonene til å melde inn sine administrative enhet/er ved å fylle ut skjema 1. Definisjonen av en administrativ enhet i denne evalueringen er å finne på side 3 (kap 1.1) i evalueringsprotokollen (vedlegg 4). Ved innmelding av administrativ/e enhet/er anbefaler Forskningsrådet institusjonene til å se innmelding av administrativ enhet/er i sammenheng med tilpasning av mandat for den administrative enheten (Appendix A i evalueringsprotokollen).

Forskergrupper – skjema 2

Forskningsrådet ber de administrative enheter om å melde inn forskergrupper i tråd med forskergruppedefinisjonen (kap 1.1) og minimumskravene beskrevet i kapittel 1.2 i evalueringsprotokollen. Hver administrative enhet melder inn sin/e forskergruppe/r ved å fylle ut Skjema 2. Vi ber også om at forskergruppene innplasseres i den tentative fagpanelinndelingen for EVALMEDHELSE (vedlegg 5).

Forskningsrådet vil ferdigstille panelstruktur og avgjøre den endelige fordelingen av forskergruppene på fagpaneler *etter* at alle forskergrupper er meldt inn. Mer informasjon vil bli sendt i slutten av juni 2023.

Invitasjon til å foreslå eksperter – skjema 3

Forskningsrådet inviterer administrative enheter og forskergrupper til å spille inn forslag til eksperter som kan inngå i evalueringskomitéene og i ekspertpanelene. Hver evalueringskomité vil bestå av 7-9 komitémedlemmer, mens hvert ekspertpanel vil bestå av 5-7 eksperter.

Obs. Det er to faner i regnearket:

- FANE 1 – forslag til medlemmer til evalueringskomitéene. Medlemmene i evalueringskomitéene skal inneha bred vitenskapelig kompetanse, både faglig kompetanse og andre kvalifikasjoner som erfaring med ledelse, strategi- og evalueringsarbeid og kunnskapsutveksling.
- FANE 2 – forslag til medlemmer til ekspertpanelene. Medlemmene i ekspertpanelene skal være internasjonalt ledende eksperter innen medisin og helsefaglig forskning og innovasjon.

Utfylte skjemaer (3 stk):

- innmelding av administrative enhet/er (skjema 1)
- innmelding av forskergruppe/er (skjema 2)
- forslag til eksperter (skjema 3)

sendes på epost til evalmedhelse@forskningsradet.no **innen 6. juni 2023.**

Tilpasning av mandat – frist 30. september 2023

Forskningsrådet ber med dette administrative enheter om å tilpasse mandatet (vedlegg 4) ved å opplyse om egne strategiske mål og andre lokale forhold som er relevant for evalueringen.

Forskningsrådet

Tilpasningen gjøres ved å fylle inn de åpne punktene i malen (Appendix A). Utfylt skjema sendes på epost til evalmedhelse@forskningsradet.no innen 30. september 2023.

Digitalt informasjonsmøte 15. mai 2023, kl. 14.00-15.00.
Forskningsrådet arrangerer et digitalt informasjonsmøte for alle som ønsker å delta i EVALMEDHELSE.

Påmelding til informasjonsmøtet gjøres her: Fagevaluering av medisin og helsefag (EVALMEDHELSE) - Digitalt informasjonsmøte (pameldingssystem.no) .

Nettsider
Forskningsrådet vil opprette en nettside på www.forskningsradet.no for EVALMEDHELSE hvor informasjon vil bli publisert fortløpende. Her kan dere lese om Fagevaluering av biovitenskap (EVALBIOVIT) 2022-2023. Fagevaluering av medisin og helsefag vil bli gjennomført etter samme modell.

Spørsmål vedrørende fagevaluering av medisin og helsefag kan rettes til Hilde G. Nielsen, hgn@forskningsradet.no eller mobil 40 92 22 60.

Med vennlig hilsen
Norges forskningsråd

Ole Johan Borge	Hilde G. Nielsen
avdelingsdirektør	spesialrådgiver
Helse	Helse

Dokumentet er elektronisk godkjent og signert og har derfor ikke håndskrevne signaturer.

Kopi
Helse- og omsorgsdepartementet
Kunnskapsdepartementet

Vedlegg
1. Adresseliste
2. Nye fagevalueringer – varsel om oppstart november 2021
3. Erfaringer med oppfølging av fagevaluering av biologi, medisin og helsefag 2010/2011
4. Fagevaluering av livsvitenskap 2022-2024 – Evalueringsprotokoll
5. Tentativ panelinndeling EVALMEDHELSE mai 2023
6. Skjema 1 – Innmeldingsskjema Administrative enheter
7. Skjema 2 – Innmeldingsskjema Forskergrupper
8. Skjema 3 – Forslag til internasjonale eksperter til evalueringskomiteene og ekspertpanelene
9. Appendix A – word format

The Research Council of Norway

Evaluation of life sciences in Norway 2022-2023

LIVSEVAL protocol version 1.0

By decision of the Portfolio board for life sciences April 5., 2022

The Research Council of Norway
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Oslo, 5 April 2022

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1 Introduction

Research assessments based on this protocol serve different aims and have different target groups. The primary aim of the evaluation of life sciences is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), and by the institute sector and regional health authorities and health trusts. These institutions will hereafter be collectively referred to as Research Performing Organisations (RPOs). The assessments should serve a formative purpose by contributing to the development of research quality and relevance at these institutions and at the national level.

1.1 Evaluation units

The assessment will comprise a number of *administrative units* submitted for evaluation by the host institution. By assessing these administrative units in light of the goals and strategies set for them by their host institution, it will be possible to learn more about how public funding is used at the institution(s) to facilitate high-quality research and how this research contributes to society. The administrative units will be assessed by evaluation committees according to sectoral affiliation and/or other relevant similarities between the units.

The administrative units will be invited to submit data on their *research groups* to be assessed by expert panels organised by research subject or theme. See Chapter 3 for details on organisation.

Administrative unit	An administrative unit is any part of an RPO that is recognised as a formal (administrative) unit of that RPO, with a designated budget, strategic goals and dedicated management. It may, for instance, be a university faculty or department, a department of an independent research institute or a hospital.
Research group	Designates groups of researchers within the administrative units that fulfil the minimum requirements set out in section 1.2. Research groups are identified and submitted for evaluation by the administrative unit, which may decide to consider itself a single research group.

1.2 Minimum requirements for research groups

1) The research group must be sufficiently large in size, i.e. at least five persons in full-time positions with research obligations. This merely indicates the minimum number, and larger units are preferable. In exceptional cases, the minimum number may include PhD students, postdoctoral fellows and/or non-tenured researchers. *In all cases, a research group must include at least three full-time tenured staff*. Adjunct professors, technical staff and other relevant personnel may be listed as group members but may not be included in the minimum number.

2) The research group subject to assessment must have been established for at least three years. Groups of more recent date may be accepted if they have come into existence as a consequence of major organisational changes within their host institution.
3) The research group should be known as such both within and outside the institution (e.g. have a separate website). It should be able to document common activities and results in the form of co-publications, research databases and infrastructure, software, or shared responsibilities for delivering education, health services or research-based solutions to designated markets.
4) In its self-assessment, the administrative unit should propose a suitable benchmark for the research group. The benchmark will be considered by the expert panels as a reference in their assessment of the performance of the group. The benchmark can be grounded in both academic and extra-academic standards and targets, depending on the purpose of the group and its host institution.

1.3 The evaluation in a nutshell

The assessment concerns:

- research that the administrative unit and its research groups have conducted in the previous 10 years
- the research strategy that the administrative units under evaluation intend to pursue going forward
- the capacity and quality of research in life sciences at the national level

The Research Council of Norway (RCN) will:

- provide a template for the Terms of Reference[1] for the assessment of RPOs and a national-level assessment in life sciences
- appoint members to evaluation committees and expert panels
- provide secretarial services
- commission reports on research personnel and publications based on data in national registries
- take responsibility for following up assessments and recommendations at the national level.

RPOs conducting research in life sciences are expected to take part in the evaluation. The board of each RPO under evaluation is responsible for tailoring the assessment to its own strategies and specific needs and for following them up within their own institution. Each participating RPO will carry out the following steps:

1) Identify the administrative unit(s) to be included as the main unit(s) of assessment
2) Specify the Terms of Reference by including information on specific tasks and/or strategic goals of relevance to the administrative unit(s)

[1] The terms of reference (ToR) document defines all aspects of how the evaluation committees and expert panels will conduct the [research area] evaluation. It defines the objectives and the scope of the evaluation, outlines the responsibilities of the involved parties, and provides a description of the resources available to carry out the evaluation.

3) The administrative unit will, in turn, be invited to register a set of research groups that fulfil the minimum criteria specified above (see section 1.2). The administrative unit may decide to consider itself a single research group.
4) For each research group, the administrative unit should select an appropriate benchmark in consultation with the group in question. This benchmark can be a reference to an academic level of performance or to the group's contributions to other institutional or sectoral purposes (see section 2.4). The benchmark will be used as a reference in the assessment of the unit by the expert panel.
5) The administrative units subject to assessment must provide information about each of their research groups, and about the administrative unit as a whole, by preparing self-assessments and by providing additional documentation in support of the self-assessment.

1.4 Target groups

- Administrative units represented by institutional management and boards
- Research groups represented by researchers and research group leaders
- Research funders
- Government

The evaluation will result in recommendations to the institutions, the RCN and the ministries. The results of the evaluation will also be disseminated for the benefit of potential students, users of research and society at large.

This protocol is intended for all participants in the evaluation. It provides the information required to organise and carry out the research assessments. Questions about the interpretation or implementation of the protocol should be addressed to the RCN.

2 Assessment criteria

The administrative units are to be assessed on the basis of five assessment criteria. The five criteria are applied in accordance with international standards. Finally, the evaluation committee passes judgement on the administrative units as a whole in qualitative terms. In this overall assessment, the committee should relate the assessment of the specific tasks to the strategic goals that the administrative unit has set for itself in the Terms of Reference.

When assessing administrative units, the committees will build on a separate assessment by expert panels of the research groups within the administrative units. See Chapter 3 'Evaluation process and organisation' for a description of the division of tasks.

2.1 Strategy, resources and organisation

The evaluation committee assesses the framework conditions for research in terms of funding, personnel, recruitment and research infrastructure in relation to the strategic aims set for the administrative unit. The administrative unit should address at least the following five specific aspects in its self-assessment: 1) funding sources, 2) national and international cooperation, 3) cross-sector and interdisciplinary cooperation, 4) research careers and mobility, and 5) Open Science. These five aspects relate to how the unit organises and actually performs its research, its composition in terms of leadership and personnel, and how the unit is run on a day-to-day basis.

To contribute to understanding what the administrative unit can or should change to improve its ability to perform, the evaluation committee is invited to focus on factors that may affect performance.

Further, the evaluation committee assesses the extent to which the administrative unit's goals for the future remain scientifically and societally relevant. It is also assessed whether its aims and strategy, as well as the foresight of its leadership and its overall management, are optimal in relation to attaining these goals. Finally, it is assessed whether the plans and resources are adequate to implement this strategy.

2.2 Research production, quality and integrity

The evaluation committee assesses the profile and quality of the administrative unit's research and the contribution the research makes to the body of scholarly knowledge and the knowledge base for other relevant sectors of society. The committee also assesses the scale of the unit's research results (scholarly publications, research infrastructure developed by the unit, and other contributions to the field) and its contribution to Open Science (early knowledge and sharing of data and other relevant digital objects, as well as science communication and collaboration with societal partners, where appropriate).

The evaluation committee considers the administrative unit's policy for research integrity and how violations of such integrity are prevented. It is interested in how the unit deals with research data, data management, confidentiality (GDPR) and integrity, and the extent to which independent and critical pursuit of research is made possible within the unit. Research integrity relates to both the scientific integrity of conducted research and the professional integrity of researchers.

2.3 Diversity and equality

The evaluation committee considers the diversity of the administrative unit, including gender equality. The presence of differences can be a powerful incentive for creativity and talent development in a diverse administrative unit. Diversity is not an end in itself in that regard, but a tool for bringing together different perspectives and opinions.

The evaluation committee considers the strategy and practices of the administrative unit to prevent discrimination on the grounds of gender, age, disability, ethnicity, religion, sexual orientation or other personal characteristics.

2.4 Relevance to institutional and sectoral purposes

The evaluation committee compares the relevance of the administrative unit's activities and results to the specific aspects detailed in the Terms of Reference for each institution and to the relevant sectoral goals (see below).

Higher Education Institutions

There are 36 Higher Education Institutions in Norway that receive public funding from the Ministry for Education and Research. Twenty-one of the 36 institutions are owned by the ministry, whereas the last 15 are privately owned. The HEIs are regulated under the Act relating to universities and university colleges of 1 August 2005.

The purposes of Norwegian HEIs are defined as follows in the Act relating to universities and university colleges[2]

- provide higher education at a high international level;
- conduct research and academic and artistic development work at a high international level;
- disseminate knowledge of the institution's activities and promote an understanding of the principle of academic freedom and application of scientific and artistic methods and results in the teaching of students, in the institution's own general activity as well as in public administration, in cultural life and in business and industry.

In line with these purposes, the Ministry for Research and Education has defined four overall goals for HEIs that receive public funding. These goals have been applied since 2015:

1) High quality in research and education
2) Research and education for welfare, value creation and innovation
3) Access to education (esp. capacity in health and teacher education)
4) Efficiency, diversity and solidity of the higher education sector and research system

The committee is invited to assess to what extent the research activities and results of each administrative unit have contributed to sectoral purposes as defined above. In particular, the committee is invited to take the share of resources spent on education at the administrative units into account and to assess the relevance and contributions of research to education, focusing on the master's and PhD levels. This assessment should be distinguished from an

[2] https://lovdata.no/dokument/NLE/lov/2005-04-01-15?q=universities

assessment of the quality of education in itself, and it is limited to the role of research in fostering high-quality education.

Research institutes (the institute sector)

Norway's large institute sector reflects a practical orientation of state R&D funding that has long historical roots. The Government's strategy for the institute sector[3] applies to the 33 independent research institutes that receive public basic funding through the RCN, in addition to 12 institutes outside the public basic funding system.

The institute sector plays an important and specific role in attaining the overall goal of the national research system, i.e. to increase competitiveness and innovation power to address major societal challenges. The research institutes' contributions to achieving these objectives should therefore form the basis for the evaluation. The main purpose of the sector is to conduct independent applied research for present and future use in the private and public sector. However, some institutes primarily focus on developing a research platform for public policy decisions, others on fulfilling their public responsibilities.

The institutes should:

- maintain a sound academic level, documented through scientific publications in recognised journals
- obtain competitive national and/or international research funding grants
- conduct contract research for private and/or public clients
- demonstrate robustness by having a reasonable number of researchers allocated to each research field

The committee is invited to assess the extent to which the research activities and results of each administrative unit contribute to sectoral purposes and overall goals as defined above. In particular, the committee is invited to assess the level of collaboration between the administrative unit(s) and partners in their own or other sectors.

The hospital sector

There are four regional health authorities (RHFs) in Norway. They are responsible for the specialist health service in their respective regions. The RHFs are regulated through the Health Enterprises Act of 15 June 2001 and are bound by requirements that apply to specialist and other health services, the Health Personnel Act and the Patient Rights Act. Under each of the regional health authorities, there are several health trusts (HFs), which can consist of one or more hospitals. A health trust (HF) is wholly owned by an RHF.

Research is one of the four main tasks of hospital trusts.[4] The three other mains tasks are to ensure good treatment, education and training of patients and relatives. Research is important if the health service is to keep abreast of stay up-to-date with medical developments and carry out critical assessments of established and new diagnostic methods,

[3] Strategy for a holistic institute policy (Kunnskapsdepartementet 2020)

[4] Cf. the Specialist Health Services Act § 3-8 and the Health Enterprises Act §§ 1 and 2

treatment options and technology, and work on quality development and patient safety while caring for and guiding patients.

The committee is invited to assess the extent to which the research activities and results of each administrative unit have contributed to sectoral purposes as described above. The assessment does not include an evaluation of the health services performed by the services.

2.5 Relevance to society

The committee assesses the quality, scale and relevance of contributions targeting specific economic, social or cultural target groups, of advisory reports on policy, of contributions to public debates, and so on. The documentation provided as the basis for the assessment of societal relevance should make it possible to assess relevance to various sectors of society (i.e. business, the public sector, non-governmental organisations and civil society).

When relevant, the administrative units will be asked to link their contributions to national and international goals set for research, including the Norwegian Long-term Plan for Research and Higher Education and the UN Sustainable Development Goals. Sector-specific objectives, e.g. those described in the Development Agreements for the HEIs and other national guidelines for the different sectors, will be assessed as part of criterion 2.4.

The committee is also invited to assess the societal impact of research based on case studies submitted by the administrative units and/or other relevant data presented to the committee. Academic impact will be assessed as part of criterion 2.2.

3 Evaluation process and organisation

The RCN will organise the assessment process as follows:

- Commission a professional secretariat to support the assessment process in the committees and panels, as well as the production of self-assessments within each RPO
- Commission reports on research personnel and publications within life sciences based on data in national registries
- Appoint one or more evaluation committees for the assessment of administrative units.
- Divide the administrative units between the appointed evaluation committees according to sectoral affiliation and/or other relevant similarities between the units.
- Appoint a number of expert panels for the assessment of research groups submitted by the administrative units.
- Divide research groups between expert panels according to similarity of research subjects or themes.
- Task the chairs of the evaluation committees with producing a national-level report building on the assessments of administrative units and a national-level assessments produced by the expert panels.

Committee members and members of the expert panels will be international, have sufficient competence and be able, as a body, to pass judgement based on all relevant assessment criteria. The RCN will facilitate the connection between the assessment levels of panels and committees by appointing committee members as panel chairs.

3.1 Division of tasks between the committee and panel levels

The expert panels will assess research groups across institutions and sectors, focusing on the first two criteria specified in Chapter 2: 'Strategy, resources and organisation' and 'Research production and quality' The assessments from the expert panels will also be used as part of the evidence base for a report on Norwegian research within life sciences (see section 3.3).

The evaluation committees will assess the administrative units based on all the criteria specified in Chapter 2. The assessment of research groups delivered by the expert panels will be a part of the evidence base for the committees' assessments of administrative units. See figure 1 below.

The evaluation committee has sole responsibility for the assessments and any recommendations in the report. The evaluation committee reaches a judgement on the research based on the administrative units and research groups' self-assessments provided by the RPOs, any additional documents provided by the RCN, and interviews with representatives of the administrative units. The additional documents will include a standardised analysis of research personnel and publications provided by the RCN.

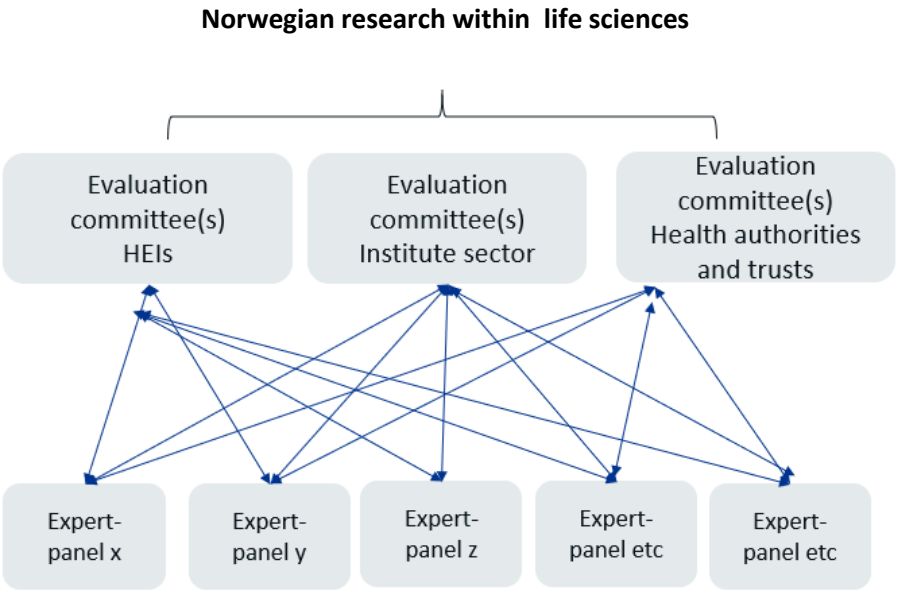

Figure 1. Evaluation committees and expert panels

The evaluation committee takes international trends and developments in science and society into account when forming its judgement. When judging the quality and relevance of the research, the committees shall bear in mind the specific tasks and/or strategic goals that the administrative unit has set for itself including sectoral purposes (see section 2.4 above).

3.2 Accuracy of factual information

The administrative unit under evaluation should be consulted to check the factual information before the final report is delivered to the RCN and the board of the institution hosting the administrative unit.

3.3 National level report

Finally, the RCN will ask the chairs of the evaluation committees to produce a national-level report that builds on the assessments of administrative units and the national-level assessments produced by the expert panels. The committee chairs will present their assessment of Norwegian research in life sciences at the national level in a separate report that pays specific attention to:

- Strengths and weaknesses of the research area in the international context
- The general resource situation regarding funding, personnel and infrastructure
- PhD training, recruitment, mobility and diversity
- Research cooperation nationally and internationally
- Societal impact and the role of research in society, including Open Science

This national-level assessment should be presented to the RCN.

Appendix A: Terms of References (ToR)

[Text in red to be filled in by the Research-performing organisations (RPOs)]

The board of [RPO] mandates the evaluation committee appointed by the Research Council of Norway (RCN) to assess [administrative unit] based on the following Terms of Reference.

Assessment
You are asked to assess the organisation, quality and diversity of research conducted by [administrative unit] as well as its relevance to institutional and sectoral purposes, and to society at large. You should do so by judging the unit's performance based on the following five assessment criteria (a. to e.). Be sure to take current international trends and developments in science and society into account in your analysis.

a) Strategy, resources and organisation
b) Research production, quality and integrity
c) Diversity and equality
d) Relevance to institutional and sectoral purposes
e) Relevance to society

For a description of these criteria, see Chapter 2 of the life sciences evaluation protocol. Please provide a written assessment for each of the five criteria. Please also provide recommendations for improvement. We ask you to pay special attention to the following [n] aspects in your assessment:

1. …
2. …
3. …
4. …

…

[To be completed by the board: specific aspects that the evaluation committee should focus on – they may be related to a) strategic issues, or b) an administrative unit's specific tasks.]

In addition, we would like your report to provide a qualitative assessment of [administrative unit] as a whole in relation to its strategic targets. The committee assesses the strategy that the administrative unit intends to pursue in the years ahead and the extent to which it will be capable of meeting its targets for research and society during this period based on available resources and competence. The committee is also invited to make recommendations concerning these two subjects.

Documentation
The necessary documentation will be made available by the life sciences secretariat at Technopolis Group.

The documents will include the following:

- a report on research personnel and publications within life sciences commissioned by RCN
- a self-assessment based on a template provided by the life sciences secretariat
- [to be completed by the board]

Interviews with representatives from the evaluated units
Interviews with the [administrative unit] will be organised by the evaluation secretariat. Such interviews can be organised as a site visit, in another specified location in Norway or as a video conference.

Statement on impartiality and confidence
The assessment should be carried out in accordance with the *Regulations on Impartiality and Confidence in the Research Council of Norway*. A statement on the impartiality of the committee members has been recorded by the RCN as a part of the appointment process. The impartiality and confidence of committee and panel members should be confirmed when evaluation data from [the administrative unit] are made available to the committee and the panels, and before any assessments are made based on these data. The RCN should be notified if questions concerning impartiality and confidence are raised by committee members during the evaluation process.

Assessment report
We ask you to report your findings in an assessment report drawn up in accordance with a format specified by the life sciences secretariat. The committee may suggest adjustments to this format at its first meeting. A draft report should be sent to the [administrative unit] and RCN by [date]. The [administrative unit] should be allowed to check the report for factual inaccuracies; if such inaccuracies are found, they should be reported to the life sciences secretariat no later than two weeks after receipt of the draft report. After the committee has made the amendments judged necessary, a corrected version of the assessment report should be sent to the board of [the RPO] and the RCN no later than two weeks after all feedback on inaccuracies has been received from [administrative unit].

Appendix B: Data sources

The lists below shows the most relevant data providers and types of data to be included in the evaluation. Data are categorised in two broad categories according to the data source: National registers and self-assessments prepared by the RFOs. The RCN will commission an analysis of data in national registers (R&D-expenditure, personnel, publications etc.) to be used as support for the committees' assessment of administrative units. The analysis will include a set of indicators related to research personnel and publications.

- **National directorates and data providers**
- Norwegian Directorate for Higher Education and Skills (HK-dir)
- Norwegian Agency for Quality Assurance in Education (NOKUT)
- Norwegian Agency for Shared Services in Education and Research (SIKT)
- Research Council of Norway (RCN)
- Statistics Norway (SSB)

National registers

1) R&D-expenditure
    a. SSB: R&D statistics
    b. SSB: Key figures for research institutes
    c. HK-dir: Database for Statistics on Higher Education (DBH)
    d. RCN: Project funding database (DVH)
    e. EU-funding: eCorda
2) Research personnel
    a. SSB: The Register of Research personnel
    b. SSB: The Doctoral Degree Register
    c. RCN: Key figures for research institutes
    d. HK-dir: Database for Statistics on Higher Education (DBH)
3) Research publications
    a. SIKT: Cristin - Current research information system in Norway
    b. SIKT: Norwegian Infrastructure for Bibliometrics
    (full bibliometric data incl. citations and co-authors)
4) Education
    a. HK-dir/DBH: Students and study points
    b. NOKUT: Study barometer
    c. NOKUT: National Teacher Survey
5) Sector-oriented research
    a. RCN: Key figures for research institutes
6) Patient treatments and health care services
    a. Research & Innovation expenditure in the health trusts
    b. Measurement of research and innovation activity in the health trusts
    c. Collaboration between health trusts and HEIs
    d. Funding of research and innovation in the health trusts
    e. Classification of medical and health research using HRCS (HO21 monitor)

Self-assessments

1) Administrative units
    a. *Self-assessment covering all assessment criteria*
    b. Administrative data on funding sources
    c. Administrative data on personnel
    d. Administrative data on the division of staff resources between research and other activities (teaching, dissemination etc.)
    e. Administrative data on research infrastructure and other support structures
    f. SWOT analysis
    g. Any supplementary data needed to assess performance related to the strategic goals and specific tasks of the unit

2) Research groups
    a. *Self-assessment covering the first two assessment criteria (see Table 1)*
    b. Administrative data on funding sources
    c. Administrative data on personnel
    d. Administrative data on contribution to sectoral purposes: teaching, commissioned work, clinical work [will be assessed at committee level]
    e. Publication profiles
    f. Example publications and other research results (databases, software etc.) The examples should be accompanied by an explanation of the groups' specific contributions to the result
    g. Any supplementary data needed to assess performance related to the benchmark defined by the administrative unit

The table below shows how different types of evaluation data may be relevant to different evaluation criteria. Please note that the self-assessment produced by the administrative units in the form of a written account of management, activities, results etc. should cover all criteria. A template for the self-assessment of research groups and administrative units will be commissioned by the RCN from the life sciences secretariat for the evaluation.

Table 1. Types of evaluation data per criterion

Evaluation units / Criteria	Research groups	Administrative units
Strategy, resources and organisation	Self-assessment Administrative data	Self-assessment National registers Administrative data SWOT analysis
Research production and quality	Self-assessment Example publications (and other research results)	Self-assessment National registers
Diversity, equality and integrity		Self-assessment National registers Administrative data
Relevance to institutional and sectoral purposes		Self-assessment Administrative data
Relevance to society		Self-assessment National registers Impact cases
Overall assessment	*Data related to:* *Benchmark defined by administrative unit*	*Data related to:* *Strategic goals and specific tasks of the admin. unit*

Evaluation of Medicine and Health (EVALMEDHELSE) 2023-2024

Self- assessment for administrative units

Date of dispatch: **15 September 2023**
Deadline for submission: **31 January 2024**

Institution (name and short name):_____
Administrative unit (name and short name): _____
Date:_____
Contact person:_____
Contact details (email):_____

Content

Introduction

The primary aim of the evaluation is to reveal and confirm the quality and the relevance of research performed at Norwegian Higher Education Institutions (HEIs), the institute sector and the health trusts. These institutions will henceforth be collectively referred to as research performing organisations (RPOs). The evaluation report(s) will provide a set of recommendations to the RPOs, the Research Council of Norway (RCN) and the responsible and concerned ministries. The results of the evaluation will also be disseminated for the benefit of potential students, users of research and society at large.

You have been invited to complete this self-assessment as an administrative unit. The self-assessment contains questions regarding the unit's research- and innovation related activities and developments over years 2012-2022. All submitted data will be evaluated by international evaluation committees. The administrative unit´s research groups will be assessed by international expert panels who report their assessment to the relevant evaluation committee.

Deadline for submitting self- assessments to the Research Council of Norway – 31 January 2024
As an administrative unit you are responsible for collecting completed self-assessments for each of the research groups that belong to the administrative unit. The research groups need to submit their completed self-assessment to the administrative unit no later than 26 January 2024. The administrative unit will submit the research groups' completed self-assessments and the administrative unit's own completed self-assessment to the Research Council within 31 January 2024.

Please use the following format when naming your document: name of the institution and short name of the administrative unit, e.g. *NTNU_FacMedHealthSci* and send it to evalmedhelse@forskningsradet.no within 31 January 2024.

For questions concerning the self-assessment or EVALMEDHELSE in general, please contact RCN at evalmedhelse@forskningsradet.no.

Thank you!

Guidelines for completing the self-assessment

- Please read the entire self-assessment document before answering.
- The evaluation language is English.
- Please be sure that all documents which are linked to in the self- assessment are in English and are accessible.
- The page format must be A4 with 2 cm margins, single spacing and Calibri and 11-point font.
- The self-assessment follows the same structure as the evaluation protocol. In order to be evaluated on all criteria, the administrative unit must answer all questions.
- Information should be provided by link to webpages i.e. strategy and other planning documents.
  - Provide information – provide documents and other relevant data or figures about the administrative unit, for example strategy and other planning documents.
  - Describe – explain and present using contextual information about the administrative unit and inform the reader about the administrative unit.
  - Reflect – comment in a reflective and evaluative manner how the administrative unit operates.
- Data on personnel should refer to reporting to DBH on 1 October 2022 for HEIs and to the yearly reporting for 2022 for the institute sector and the health trusts. Other data should refer to 31 December 2022, if not specified otherwise.
- Questions in 4.3c should **ONLY** be answered by administrative units responsible for the Cand.med. degree programme, cf. Evaluation of the Professional programme in Medicine (NOKUT).
- It is possible to extend the textboxes when filling in the from. **NB!** A completed self- assessment cannot exceed 50 pages (pdf file) excluding question 4.3.c. The evaluation committees are not requested to read more than the maximum of 50 pages. Pages exceeding maximum limit of 50 pages **might not** be evaluated.
- Submit the self- assessment as a pdf (max 50 pages). Before submission, please be sure that all text are readable after the conversion of the document to pdf. The administrative unit is responsible for submitting the self-assessment of the administrative unit together with the self-assessments of the belonging research group(s) to evalmedhelse@forskningsradet.no within **31 January 2024.**

Please note that information you write in the self- assessment and the links to documents/webpages in the self- assessment are the only available information (data material) for the evaluation committee.

In exceptional cases, documents/publications that are not openly available must be submitted as attachment(s) to the self- assessment (pdf file(s)).

1.Strategy, resources and organisation

1.1 Research strategy

Describe the main strategic goals for research and innovation of the administrative unit. You may include the following:

- How are these goals related to institutional strategies and scientific priorities?
- Describe how the administrative unit's strategies and scientific priorities are related to the "specific aspects that the evaluation committee should focus on" indicated in your Terms of Reference (ToR)
- Describe the main fields and focus of research and innovation in the administrative unit
- Describe the planned research-field impact; planned policy impact and planned societal impact
- Describe how the strategy is followed-up in the allocation of resources and other measures
- Describe the most important occasions where priorities are made (i.e., announcement of new positions, applying for external funding, following up on evaluations)
- If there is no research strategy – please explain why

Table 1. Administrative unit`s strategies

For each category present up to 5 documents which are most relevant for the administrative unit. Please delete lines which are not in use.

Research strategy		
No.	**Title**	**Link**
1		
2		
3		
4		
5		
Outreach strategies		
No.	**Title**	**Link**
1		
2		
3		
4		
5		
Open science policy		
No.	**Title**	**Link**
1		
2		
3		
4		
5		

1.2 Organisation of research

a) Describe the organisation of research and innovation activities/projects at the administrative unit, including how responsibilities for research and other purposes (education, knowledge exchange, patient treatment, researcher training, outreach activities etc.) are distributed and delegated.

b) Describe how you work to maximise synergies between the different purposes of the administrative unit (education, knowledge exchange, patient treatment, researcher training, outreach activities etc.).

1.3 Research staff

Describe the profile of research personnel at the administrative unit in terms of position and gender. Institutions in the higher education sector should use the categories used in DBH, https://dbh.hkdir.no/datainnhold/kodeverk/stillingskoder.

RCN has commissioned reports from Statistics Norway (SSB) on personnel for the administrative units included in the evaluation. These reports will be made available to the units early November 2023.

Only a subset of the administrative units submitted to the evaluation is directly identifiable in the national statistics. Therefore, we ask all administrative units to provide data on their R&D personnel. Institutions that are directly identifiable in the national statistics (mainly higher education) are invited to use the figures provided in the report delivered by Statistics Norway. Please delete lines which are not in use.

Table 2. Research staff

	Position by category	**No. of researcher per category**	**Share of women per category (%)**	**No. of researchers who are part of multiple (other) research groups at the admin unit**	**No. of temporary positions**
No. of Personell by position	Position A (Fill in)				
	Position B (Fill in)				
	Position C (Fill in)				
	Position D (Fill in)				

1.4 Researcher careers opportunities

a) Describe the structures and practices to support researcher careers and help early-career researchers to make their way into the profession.

b) Describe how research time is distributed among staff including criteria for research leave/sabbaticals (forskningstermin/undervisningsfri).

c) Describe research mobility options.

1.5 Research funding

a) Describe the funding sources of the administrative unit. Indicate the administrative unit´s total yearly budget and the share of the unit's budget dedicated to research.

b) Give an overview of the administrative unit's competitive national and/or international grants last five years (2018-2022).

Table 3. R&D funding sources
Please indicate R&D funding sources for the administrative unit for the period 2018-2022 (average NOK per year, last five years).

For Higher Education Institutions: Share of basic grant (grunnbevilgning) used for R&D[1] **For Research Institutes and Health Trusts: Direct R&D funding from Ministries (per ministry)**	
Name of ministry	NOK

National grants (bidragsinntekter) (NOK)	
From the ministries and underlying directorates	
From industry	
From public sector	
Other national grants	
Total National grants	
National contract research (oppdragsinntekter)[2] (NOK)	
From the ministries and underlying directorates	
From industry	

[1] Shares may be calculated based on full time equivalents (FTE) allocated to research compared to total FTE in administrative unit

[2] For research institutes only research activities should be included from section 1.3 in the yearly reporting

From public sector	
Other national contract research	
Total contract research	
International grants (NOK)	
From the European Union	
From industry	
Other international grants	
Total international grants	
Funding related to public management (forvaltningsoppgaver) or (if applicable) funding related to special hospital tasks, if any	
Total funding related to public management/special hospital tasks	
Total all R&D budget items (except basic grant)	

1.6 Collaboration

Describe the administrative unit's policy towards national and international collaboration partners, the type of the collaborations the administrative unit have with the partners, how the collaboration is put to practice as well as cross-sectorial and interdisciplinary collaborations.

- Reflect of how successful the administrative unit has been in meeting its aspirations for collaborations
- Reflect on the importance of different types of collaboration for the administrative unit: National and international collaborations. Collaborations with different sectors, including public, private and third sector
- Reflect on the added value of these collaborations to the administrative unit and Norwegian research system

Table 4a. The main national collaborative constellations with the administrative unit
Please categorise the collaboration according to the most important national partner(s): 5-10 institutions in the period 2012-2022. Please delete lines which are not in use.

National collaborations

Collaboration with national institutions – 1 -10	
Name of main collaboration or collaborative project with the admin unit	
Name of partner institution(s)	
Sector of partner/institution(s)/sectors involved	
Impacts and relevance of the collaboration	

Table 4b. The main international collaborative constellations with the administrative unit
Please categorise the collaboration according to the most important international partner(s): 5-10 international institutions in the period 2012-2022. Please delete lines which are not in use.

International collaborations

Collaboration with international institutions – 1-10	
Name of main collaboration or collaborative project with the admin unit	
Name of partner institution(s)	
Sector of partner/institution(s)/sectors involved	

Impacts and relevance of the collaboration	

1.7 Open science policies

a) Describe the institutional policies, approaches, and activities to the Open Science areas which may include the following:

- Open access to publications
- Open access to research data and implementation of FAIR data principles
- Open-source software/tools
- Open access to educational resources
- Open peer review
- Citizen science and/or involvement of stakeholders / user groups
- Skills and training for Open Science

b) Describe the most important contributions and impact of the administrative unit's researchers towards the different Open Science areas cf. 1.7a above.

c) Describe the institutional policy regarding ownership of research data, data management, and confidentiality. Is the use of data management plans implemented at the administrative unit?

1.8 SWOT analysis for administrative units

Instructions: Please complete a SWOT analysis for your administrative unit. Reflect on what are the major internal Strengths and Weaknesses as well as external Threats and Opportunities for your research and innovation activities/projects and research environment. Assess what the present Strengths enable in the future and what kinds of Threats are related to the Weaknesses. Consider your scientific expertise and achievements, funding, facilities, organisation and management.

Internal	**Strengths**	**Weaknesses**
External	**Opportunities**	**Threats**

2. Research production, quality and integrity

2.1 Research quality and integrity

Please see the bibliometric analysis for the administrative unit developed by NIFU (available by the end of October, 2023).

a) Describe the scientific focus areas of the research conducted at the administrative unit, including the unit's contribution to these areas.

b) Describe the administrative unit's policy for research integrity, including preventative measures when integrity is at risk, or violated.

2.2 Research infrastructures

a) Participation in national infrastructure

Describe the most important participation in the national infrastructures listed in the Norwegian roadmap for research infrastructures (Norsk veikart for forskningsinfrastruktur) including as host institution(s).

Table 5. Participation in national infrastructure

Please present up to 5 participations in the national infrastructures listed in the Norwegian roadmap for research infrastructures (Norsk veikart for forskningsinfrastruktur) for each area that were the most important to your administrative unit.

Areas in roadmap	Name of research infrastructure	Period (from year to year)	Description	Link to website

b) Participation in international infrastructures

Describe the most important participation in the international infrastructures funded by the ministries (Norsk deltakelse i internasjonale forskningsorganisasjoner finansiert av departementene).

Table 6. Participation in international infrastructure

Please describe up to 5 participations in international infrastructures for each area that have been most important to your administrative unit.

Project	Name	Period (from year to year)	Description	Link to infrastructure

c) Participation in European (ESFRI) infrastructures

Describe the most important participation in European (ESFRI) infrastructures (Norske medlemskap i infrastrukturer i ESFRI roadmap) including as host institution(s).

Table 7. Participation in infrastructures on the ESFRI Roadmap
Please give a description of up to 5 participations that have been most important to your administrative unit.

Social sciences and the humanities				
Name	**ESFRI-project**	**Summary of participation**	**Period (from year to year)**	**Link**

d) Access to research infrastructures
Describe access to relevant national and/or international research infrastructures for your researchers. Considering both physical and digital infrastructure.

e) FAIR- principles
Describe what is done at the unit to fulfil the FAIR-principles.

3. Diversity and equality

Describe the policy and practices to protect against any form of discrimination and to promote diversity in the administrative unit.

Table 8. Administrative unit policy against discrimination
Give a description of up to 5 documents that are the most relevant. If the administrative unit uses the strategies, policies, etc. of a larger institution, then these documents should be referred to.
Please delete lines which are not in use.

No.	**Name**	**Valid period**	**Link**
1			

4. Relevance to institutional and sectorial purposes

4.1 Sector specific impact

Describe whether the administrative unit has activities aimed at achieving sector-specific objectives or focusing on contributing to the knowledge base in general. Describe activities connected to sector-specific objectives, the rationale for participation and achieved and/or expected impacts. Please refer to chapter 2.4 in the evaluation protocol.

- Alternatively, describe whether the activities of the administrative unit are aimed at contribution to the knowledge base in general. Describe the rationale for this approach and the impacts of the unit's work to the knowledge base.

4.2 Research innovation and commercialisation

a) Describe the administrative unit's practices for innovation and commercialisation.

b) Describe the motivation among the research staff in doing innovation and commercialisation activities.

c) Describe how innovation and commercialisation is supported at the administrative unit.

Table 9. Policies for innovation including IP policies, new patents, licenses, start-up/spin-off guidelines
Describe up to 5 documents of the administrative unit's policies for innovation, including IP policies, new patents, licenses, start-up/spin-off guidelines, etc., that are the most relevant. If the administrative unit uses the strategies, policies, etc. of a larger institution, then present these documents. Please delete lines which are not in use.

No.	Name	Valid period	Link
1			

Table 10. Administrative description of successful innovation and commercialisation results
Please describe up to 10 successful innovation and commercialisation results at your administrative unit in the period 2012-2022. Please delete lines which are not in use.

No.	Name of innovation and commercial results	Link	Description of successful innovation and commercialisation result.
1			

4.3 Higher education institutions

a) Reflect how research at the administrative unit contributes towards master and PhD-level education provision, at your institutions and beyond.

b) Describe the opportunities for master students to become involved in research activities at the administrative unit.

c) **ONLY** for administrative units responsible for the Cand.med. degree programme, cf. Evaluation of the Professional programme in Medicine (NOKUT).

- Reflect on how research at the administrative unit contributes towards the quality of the Cand.med. degree programme at your institutions and beyond.
- Describe the different opportunities for students on the Cand.med. degree programme to become involved in research activities at the administrative unit, and the extent to which students use those opportunities.

4.4 Research institutes

a) Describe how the research and innovation activities/projects at the administrative unit contribute to the knowledge base for policy development, sustainable development, and societal and industrial transformations more generally.

b) Describe the most important research activities with partners outside of research organisations.

4.5 Health trusts

a) Reflect on how the administrative unit's clinical research, innovation and commercialisation contribute towards development, assessment and implementation of new diagnostic methods, treatment, and healthcare technologies.

b) Reflect on how research at the unit contributes towards the quality of relevant education programme at your institutions or beyond.

c) Describe the different opportunities for students on relevant educational programmes to become involved in research activities at the administrative unit, and the extent to which students use those opportunities.

5. Relevance to society

Reflect on the administrative unit's contribution towards the Norwegian Long-term plan for research and higher education, societal challenges more widely, and the UN Sustainable Development Goals.

5.1 Impact cases

Please use the attached template for impact cases. Each impact case should be submitted as an attachment (pdf) to the self-assessment.

Impact case guidelines

Each case study should include sufficiently clear and detailed information to enable the evaluation committee to make judgements based on the information it contains, without making inferences, gathering additional material, following up references or relying on members' prior knowledge. References to other sources of information will be used for verification purposes only, not as a means for the evaluation committee to gather further information to inform judgements.

In this evaluation, impact is defined as an effect on, change or benefit to the economy, society, culture, public policy or services, health, the environment or quality of life, beyond academia.

Timeframes

- The impact must have occurred between 2012 and 2022
- Some of the underpinning research should have been published in 2012 or later
- The administrative units are encouraged to prioritise recent cases

Page limit

Each completed case study template will be limited to **five pages** in length. Within the annotated template below, indicative guidance is provided about the expected maximum length limit of each section, but institutions will have flexibility to exceed these so long as the case study as a whole remains no longer than **five pages** (font Calibri, font size 11). Please write the text into the framed template under the sections 1–5 below. The guiding text that stands there now, can be deleted.

Maximum number of cases permitted per administrative unit

For up to 10 researchers: one case; for 10 to 30 researchers: two cases; for 30-50 researchers: three cases; for 50-100 researchers: four cases, and up to five cases for units exceeding 100 researchers.

Naming and numbering of cases

Please use the standardised short name for the administrative unit, and the case number for the unit (1,2,3, etc) in the headline of the case. Each case should be stored as a separate PDF-document with the file name: [Name of the institution and name of the administrative unit] [case number]

Publication of cases

RCN plans to publish all impact cases in a separate evaluation report. By submitting the case the head of the administrative units consents to the publication of the case. Please indicate below if a case may not be made public for reasons of confidentiality.

If relevant, describe any reason to keep this case confidential:

Please write the text here

[Name of the institution and name of the administrative unit] [case number]

Institution:
Administrative unit:
Title of case study:
Period when the underpinning research was undertaken:
Period when staff involved in the underpinning research were employed by the submitting institution:
Period when the impact occurred:

1. Summary of the impact (indicative maximum 100 words)
This section should briefly state what specific impact is being described in the case study.

2. Underpinning research (indicative maximum 500 words)
This section should outline the key research insights or findings that underpinned the impact, and provide details of what research was undertaken, when, and by whom. This research may be a body of work produced over a number of years or may be the output(s) of a particular project. References to specific research outputs that embody the research described in this section, and evidence of its quality, should be provided in the next section. Details of the following should be provided in this section:

- The nature of the research insights or findings which relate to the impact claimed in the case study.
- An outline of what the underpinning research produced by the submitted unit was (this may relate to one or more research outputs, projects or programmes).
- Dates of when it was carried out.
- Names of the key researchers and what positions they held at the administrative unit at the time of the research (where researchers joined or left the administrative unit during this time, these dates must also be stated).
- Any relevant key contextual information about this area of research.

3. References to the research (indicative maximum of six references)
This section should provide references to key outputs from the research described in the previous section, and evidence about the quality of the research. All forms of output cited as underpinning research will be considered equitably, with no distinction being made between the types of output referenced. Include the following details for each cited output:
- Author(s)
- Title
- Year of publication
- Type of output and other relevant details required to identify the output (for example, DOI, journal title and issue)
- Details to enable the panel to gain access to the output, if required (for example, a DOI or URL).

All outputs cited in this section must be capable of being made available to panels. If they are not available in the public domain, the administrative unit must be able to provide them if requested by RCN or the evaluation secretariate.

4. Details of the impact (indicative maximum 750 words)
This section should provide a narrative, with supporting evidence, to explain:

- How the research underpinned (made a distinct and material contribution to) the impact;
- The nature and extent of the impact.

The following should be provided:
- A clear explanation of the process or means through which the research led to, underpinned or made a contribution to the impact (for example, how it was disseminated, how it came to influence users or beneficiaries, or how it came to be exploited, taken up or applied).

- Where the submitted administrative unit's research was part of a wider body of research that contributed to the impact (for example, where there has been research collaboration with other institutions), the case study should specify the particular contribution of the submitted administrative unit's research and acknowledge other key research contributions.
- Details of the beneficiaries – who or what community, constituency or organisation has benefitted, been affected or impacted on.
- Details of the nature of the impact – how they have benefitted, been affected or impacted on.
- Evidence or indicators of the extent of the impact described, as appropriate to the case being made.
- Dates of when these impacts occurred.

5. Sources to corroborate the impact (indicative maximum of ten references)

Institution	Administrative unit	Name of research group	Expert panel
NTNU	Faculty of Medicine and Health Sciences	Anaesthesia and Emergency Medicine	Panel 3b-1
NTNU	Faculty of Medicine and Health Sciences	Centre for Care research CCR	Panel 4c
NTNU	Faculty of Medicine and Health Sciences	Centre for Excellence in Molecular Inflammation Research (CEMIR)	Panel 2a
NTNU	Faculty of Medicine and Health Sciences	Curcuits and Plasticity	Panel 1b
NTNU	Faculty of Medicine and Health Sciences	Exercise, circulation and respiration	Panel 1a
NTNU	Faculty of Medicine and Health Sciences	GeMS	Panel 3b-1
NTNU	Faculty of Medicine and Health Sciences	HUNT	Panel 4e
NTNU	Faculty of Medicine and Health Sciences	HUNT	Panel 4e
NTNU	Faculty of Medicine and Health Sciences	IMPACTS	Panel 4a
NTNU	Faculty of Medicine and Health Sciences	Integrative Neuroscience Group	Panel 2c
NTNU	Faculty of Medicine and Health Sciences	MR	Panel 3a-2
NTNU	Faculty of Medicine and Health Sciences	MSK-RG	Panel 4d
NTNU	Faculty of Medicine and Health Sciences	NorHEAD	Panel 3b-1
NTNU	Faculty of Medicine and Health Sciences	NTNU Low Birth Weight Life	Panel 3a-1
NTNU	Faculty of Medicine and Health Sciences	REGFORSK Registry research for the health care services	Panel 4c
NTNU	Faculty of Medicine and Health Sciences	Regional Centre for Child and Youth Mental Health and Child Welfare	Panel 4a
NTNU	Faculty of Medicine and Health Sciences	Research group for cancer and palliative care	Panel 3a-2
NTNU	Faculty of Medicine and Health Sciences	Sensory and Motor Systems	Panel 1b
NTNU	Faculty of Medicine and Health Sciences	Space, time and memory	Panel 1b
NTNU	Faculty of Medicine and Health Sciences	Unit of Laboratory medicine	Panel 2c
NTNU	Faculty of Medicine and Health Sciences	USRG	Panel 3a-2
NTNU	Faculty of Medicine and Health Sciences	Women's health	Panel 3a-1

Scales for research group assessment

Use whole integers only – no fractions!

Organisational dimension

Score	Organisational environment
5	An organisational environment that is outstanding for supporting the production of excellent research.
4	An organisational environment that is very strong for supporting the production of excellent research.
3	An organisational environment that is adequate for supporting the production of excellent research.
2	An organisational environment that is modest for supporting the production of excellent research.
1	An organisational environment that is not supportive for the production of excellent research.

Quality dimension

The quality dimension consists of two judgements: 1) Research and publication quality, and 2) Research group's contribution. The first judgement is defined as follows:

Score	Research and publication quality	Supporting explanation
5	Quality that is outstanding in terms of originality, significance, and rigour.	**The quality of the research is world leadin**g in terms of quality, and is comparable to the best work internationally in the same area of research. The publications submitted provide evidence that the work of the group meets the highest international standards in terms of originality, significance, and rigour. Work at this level should be a key international reference in its area.
4	Quality that is internationally excellent in terms of originality, significance and rigour but which falls short of the highest standards of excellence.	**The quality of the research is internationally excellent**. The research is clearly of an international standard, with a very good level of quality in terms of originality, significance, and rigour. Work at this level can arouse significant interest in the international academic community, and international journals with the most rigorous standards of publication (irrespective of the place or language of publication) could publish work of this level.
3	Quality that is recognised internationally in terms of originality, significance and rigour.	**The quality of the research is sufficient to achieve some international recognition.** It would be perceived nationally as strong and may occasionally reach an internationally recognised level in terms of originality, significance and rigour. Internationally recognised journals could publish some work of this level.
2	Quality that meets the published definition of research for the purposes of this assessment.	The international academic community would deem the research to be nationally acceptable, but below world standards. Legitimate nationally recognised peer-reviewed journals could publish work of this level.
1	Quality that falls below the published definition of research for the purposes of this assessment[1].	**The quality of the research** is well below international level, and is unpublishable in legitimate peer-reviewed research journals.

[1] A publication has to meet all of the criteria below:

Societal impact dimension

The societal impact dimension is also composed of two judgements, defined as presented in the table below.

Score	Research group's societal contribution, taking into consideration the resources available to the group	Score	User involvement
5	The group has contributed extensively to economic, societal and/or cultural development in Norway and/or internationally.	5	Societal partner involvement is outstanding – partners have had an important role in all parts of the research process, from problem formulation to the publication and/or process or product innovation.
4	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is very considerable given what is expected from groups in the same research field.	4	Societal partners have very considerable involvement in all parts of the research process, from problem formulation to the publication and/or process or product innovation.
3	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is on par with what is expected from groups in the same research field.	3	Societal partners have considerable involvement in the research process, from problem formulation to the publication and/or process or product innovation.
2	The group's contribution to economic, societal and/or cultural development in Norway and/or internationally is modest given what is expected from groups in the same research field.	2	Societal partners have a modest part in the research process, from problem formulation to the publication and/or process or product innovation.
1	There is little documentation of contributions from the group to economic, societal and/or cultural development in Norway and/or internationally.	1	There is little documentation of societal partners' participation in the research process, from problem formulation to the publication and/or process or product innovation.

Methods and limitations

Methods

The evaluation is based on documentary evidence and online interviews with the representatives of Administrative Unit.

The documentary inputs to the evaluation were:

- Evaluation Protocol Evaluation of life sciences in Norway 2022-2023
- Administrative Unit´s Terms of Reference
- Administrative Unit's self-assessment report
- Administrative Unit's impact cases
- Administrative Unit's research groups evaluation reports
- Panel reports from the Expert panels
- Bibliometric data (*NIFU Nordic Institute for Studies of innovation, research and education*)
- Personnel data (*Statistics Norway (SSB)*)
- Funding data – The Research Council´s contribution to biosciences research (*RCN*)
- Extract from the Survey for academic staff and the Student Survey (*Norwegian Agency for Quality Assurance in Education (NOKUT)*)

After the documentary review, the Committee held a meeting and discussed an initial assessment against the assessment criteria and defined questions for the interview with the Administrative Unit. The Committee shared the interview questions with the Administrative Unit two weeks before the interview.

Following the documentary review, the Committee interviewed the Administrative Unit in an hour-long virtual meeting to fact-check the Committee's understanding and refine perceptions. The Administrative Unit presented answers to the Committee's questions and addressed other follow-up questions.

After the online interview, the Committee attended the final meeting to review the initial assessment in light of the interview and make any final adjustments.

A one-page summary of the Administrative Unit was developed based on the information from the self-assessment, the research group assessment, and the interview. The Administrative Unit had the opportunity to fact-check this summary. The Administrative Unit approved the summary without adjustments. ***(Adjust the text if the AU asked for corrections. Include the AU request and explain what adjustments were made).***

Limitations

(Choose one of the three options below and delete the others. Feel free to elaborate slightly if necessary. For example, if you choose option 3, explain the missing information. Note that the Committee can provide detailed feedback and suggestions on improving the evaluation in the Memorandum to the RCN. This section has to remain concise and only summarise whether the information was or was not sufficient.)

(1) The Committee judged the information received through documentary inputs and the interview with the Administrative Unit sufficient to complete the evaluation.

(2) The Committee judged that the Administrative Unit self-assessment report was insufficient to assess all evaluation criteria fully. However, the interview with the Administrative Unit filled gaps in the Committee's understanding, and the information was sufficient to complete the evaluation.
(3) The Committee judged that the Administrative Unit’s self-assessment report was insufficient to assess all evaluation criteria fully, and some information gaps remained after the interview with the Administrative Unit.

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