

Evaluation of clinical, epidemiological, public health, health-related and psychological research in Norway.

**Joint Committee Report:**

## **Structural issues arising from the panel evaluations**



**Norges forskningsråd**

*The Research Council of Norway*

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# 1. INTRODUCTION

This document comments on some of the main issues that arose from an evaluation of clinical, epidemiological, public health, health-related and psychological research in Norwegian universities, university hospitals and relevant research institutes. The evaluation was commissioned by the Research Council of Norway, with the main aim of providing a basis for future strategic planning in the area of clinical and public health research.

Between May and September 2003, three expert panels worked independently in the evaluation of three broad areas of research:

- Clinical research (Panel 1)
- Public health and health-related research (Panel 2)
- Psychology and psychiatry (Panel 3).

Each panel has produced its own report that comments on and makes recommendations for the quality, relevance and management of the research undertaken in the research fields evaluated. In order to provide general recommendations at a national level for research in these fields, a Joint Committee was established comprising members from each of the three evaluation panels.

The Joint Committee decided that this summary report should concentrate on the important structural issues and problems that face Norwegian research in these fields, with recommendations for possible solutions to these problems. The report does therefore not deal with issues related to the quality and relevance of the research undertaken. The Joint Committee considered that such issues are specific to the different research fields and should be read in the context of each panel's work. The reader is therefore referred to the three separate reports that present the panels' opinions on areas of Norwegian research in these fields that are very good and internationally strong, as well as those that appear to be weak. Overall, the panels have identified a number of successful research themes and some very good research groups, but there are also some important weaknesses.

## *The importance of health research*

A high research standard is essential to the maintenance of the health of a population and in the planning and evaluation of health care systems and policies. Good quality research undertaken in the clinical and health fields is crucial in many activities:

- Understanding the aetiology of disease and ill-health
- Understanding the factors that keep people healthy with a good quality of life
- Evaluating clinical and other health interventions
- Identifying and incorporating best international practice in treatment and prevention
- Providing material for evidence-based decisionmaking in clinical medicine and health policy
- Assisting health authorities to better plan and develop health care services
- Maintaining high standards of teaching in the medical and health fields
- Generating opportunities in the pharmaceutical industry and the biotechnology sector
- Encouraging the development of new products and medical instruments.

It must be a national priority for Norway to reach and maintain an internationally competitive level in the different fields of clinical and health research. This will be a crucial factor in the further maintenance of a healthy population and an effective health care service in the longer term. Norway's share of new biomedical discoveries and innovations should also be guaranteed.

## 2. THE EVALUATION PROCESS

### *Evaluation panels*

Each of the three evaluation panels was composed of eight or nine internationally recognized experts in fields relevant to the areas under assessment. The panels made separate one-week visits to Oslo to meet with the research groups to be evaluated. Panel 1 made two visits, in June and September 2003, while Panels 2 and 3 visited Oslo in May/June 2003.

The material provided to the panels came from several sources. Prior to the panels' visits, each research group, or in some cases larger research units, delivered a self-evaluation that described the work undertaken and evaluated the group/department's strengths and weaknesses. Information was also provided on the structure and priorities of the relevant university faculties. During the panels' visits in Oslo, group representatives made formal presentations, followed by discussion with the panel. The Norwegian Research Council provided further background material, including an overview of the organisation and administration in the universities and institutes and a review of the extent of publication in the international scientific literature.

Each panel was asked to evaluate scientific activities with respect to their quality, relevance and international and national collaboration and also to assess the way in which the research was organized and managed within the institutions. The panels prepared separate reports that provided general conclusions and recommendations for the research undertaken as well as more detailed assessments of the research groups evaluated. These reports were finalised through e-mail correspondence amongst the relevant panel members, with collective agreement on the assessments and recommendations presented.

The research areas evaluated by each panel were as follows:

- Panel 1: Clinical research; involving a large number of research groups, departments and other units working in university environments and at hospitals affiliated to universities.
- Panel 2: Public health, epidemiology, psychology (as relevant), behavioural research, health services research, ethics and health-related social science; involving 20 research groups working in either university faculties or the institute sector.
- Panel 3: Psychology and psychiatry, including biological psychology, epidemiology (as relevant), cognitive psychology, cognitive neuropsychology, genetics, social psychology and health psychology; involving 23 research groups working in the four Norwegian universities.

The level at which research was evaluated could be at the level of institute, department, unit or section (but not the individual researcher). The term 'research group' is used here to cover these various levels. The areas of research evaluated by the three panels are very broad and, while they are closely related in many ways, they also have their own organisational, methodological and terminological characteristics. For the purposes of this report, they are grouped together under the heading of 'clinical and health research', which is intended to include the wide spectrum of clinical and psychological research as well as the many fields that come under the umbrella of public health and health services research.

### *Joint Committee*

The Joint Committee comprised two members from each of the three appointed evaluation panels (see Appendix 1). This committee met for two days in Oslo in November 2003, to discuss general recommendations that could be made at a national level for the research fields evaluated. Appendix 2 presents the Terms of reference provided by the Norwegian Research Council. As noted above, the Joint Committee considered that issues of quality and relevance of the research undertaken had already been dealt with in the individual panel reports. The Joint Committee therefore focussed on the structural issues that face health research in Norway.

### 3. STRUCTURAL ISSUES FACING CLINICAL AND HEALTH RESEARCH IN NORWAY

There is no doubt that some excellent research is being undertaken in Norway in the fields that were evaluated. However, the evaluation panels have identified some major structural problems that appear to be common to most of the research groups assessed. While these problems may not be unique to Norwegian research, they appear to be more pronounced than in other comparable countries and are indeed detrimental to Norwegian science.

#### 3.1 Funding for research

The total amount of money spent on research and development in Norway is 1.7% of the GNP c.f. an average of 2.2% for OECD countries (Nøkketall for medisinsk og helsefaglig forskning, Norges forskningsråd, 2003, p. 48). The so-called Barcelona statement of EU countries states a 3% GNP level as a long-term political goal. Norway is therefore considerably behind comparable countries as to general research funding. Norway also spends less money on clinical and health research than a number of comparable countries – among these the other Nordic countries. The level of funding from the Norwegian Research Council should be increased. Many of the research groups assessed mentioned insufficient funding for research, whether this was reflected in insufficient time, personnel or infrastructure.

Increased overall funding would be insufficient alone, however. It would seem that, besides the earmarked funds that are provided by central government and are allocated through competitive grant proposals, there is a considerable amount of other money provided to research that is neither adequately identified nor exposed to competition. Such money comes from the health regions, directly from the government or is provided as core funding by the universities. It appears, for example, that the health regions pay for some professor II positions, many PhD students, some laboratory and other core facilities for research, many clinical examination procedures and, in some cases, also for clinical trials that have supplementary external funding. Initial attempts to identify the total amount of money used for clinical research have suggested a figure of 197.1 million NOK in 1999 (Nøkkeltall, 2003). Earmarked funding for clinical research increased from 48.2 million NOK in 1999 to 96 million NOK in 2003.

While it is important to identify the total amount of funds spent on clinical and health research, just as important is the allocation of funds through competition. In clinical research, systems established in other Scandinavian countries often require that research-active physicians in university hospitals apply for time and other resources to conduct their research. Long-term funding (3 years) is usually given to provide stability. The applications are evaluated by research committees from the same or external medical faculties and scientific productivity is monitored. The level of funding for clinical research at the university hospitals is typically 3-5% of the hospital budget.

#### **Funding for research: recommendations**

- The overall level of funding for medical and health research should be increased in order to place Norway at a funding level similar to that of comparable countries
- A well-structured program should be implemented both to clarify the amount of money already used for medical and health research and its allocation.
- Establish a target level for government support of money earmarked for clinical research, including research time for clinically active physicians.
- Distribution of funds should be made according to priorities and preferably with a high component of competition
- Funding allocation needs to have an element of flexibility, for example to enable the development of strategic initiatives, to deal with new issues that emerge.
- Reconsider possible strategic approaches for long-term funding of research groups in order to make sure that very important research fields and initiatives have a long-term basis
- To avoid putting less experienced scientists at a disadvantage, grant applications could be divided into categories so that researchers compete with others at the same level

## 3.2 Research infrastructure and coordination of research

Modern health research at an international level requires the coordinated use of different technologies, methods and expertise. This in turn necessitates an adequate and supportive infrastructure that provides the necessary equipment and facilities, as well as a range of technical skills such as offered by bioinformatics, laboratory technicians, molecular biologists, biochemists, statisticians, database technicians, secretaries and other skilled research staff. The research group must have a critical mass to be able to develop new ideas using an interdisciplinary approach and to incorporate the use of the latest technologies and methodologies. It appears in many cases, however, that such core facilities are either absent or underutilised in Norwegian research and individual groups are hampered in their research by limited access to specialist support and/or equipment.

In order to be internationally competitive in the field of clinical research, Norway needs to focus to a much greater extent on molecular mechanisms through the use of coordinated and interdisciplinary ('translational') research. This can be accomplished through the establishment of core research facilities that can provide such expertise to the clinical scientists. The medical faculties are becomingly increasingly aware of this lack of translational research and are already taking steps to encourage such an approach. However, immediate and directed programs by the Research Council and/or other funding bodies are essential to raise the current status of Norwegian clinical research to an internationally competitive standard. Such programs should include both the required intellectual expertise and the necessary technical facilities. Research-oriented clinicians should be working together with biologists, geneticists and other basic sciences specialists. Similarly, a strengthened collaboration between, for example, epidemiologists and health service researchers would combine epidemiological databases and methodological tools with the analytical framework and approaches of health services research.

Universities have three basic functions – teaching, research and the distribution of knowledge out to the general community, policy-makers and the industry sector. It is essential that research is able to bridge the gap between the development of knowledge and the application of that knowledge. In the current context, one would expect good core research facilities where well-trained basic scientists work alongside well-trained clinicians, or where epidemiological knowledge is converted into appropriate public health policies. There is no well-developed biotechnology industry in Norway – this is imperative to be at the world forefront. Strategic investment in this field would yield considerable rewards and would promote synergism between the basic sciences and clinical work. The link between health policy and public health research is also rather weak in Norway.

The Norwegian Research Council could start a new initiative of supporting interdisciplinary research activities and networking by providing start-up money for consortia that work on the same topic or problem and include researchers from different institutions and departments. The research theme would have a loose organisation that is headed by a coordinator. The consortia could include, when appropriate, biotechnology start-ups or other companies that utilise and exploit the innovations, and also research groups from abroad. The setting up of such cross-sectional research themes would alleviate current problems of overly small research groups, isolation and the lack of collaborative and interdisciplinary research. The basic funding for the themes could come from the Research Council, the universities themselves or directly from the ministries, especially when the theme is a specially designated priority at national level.

### Research infrastructure and coordination: recommendations

- Improve the research infrastructure in terms of technical skills (e.g. bioinformatics, statisticians, technicians) and equipment and facilities (e.g. access to laboratory facilities and biobanks, register-based research facilities, techniques such as positron emission tomography and functional magnetic resonance imaging).
- Support thematic research programs based on collaborative and interdisciplinary work (translational research), that is centred around a common problem or theme.
- Establish coordination initiatives to develop agreed profiles of research and division of labour to avoid duplication of research efforts
- Increase contacts between basic scientists and research (for example, postdoctoral positions for trained basic scientists to work in a clinical setting; establish core laboratory facilities in the hospitals)
- Consider the establishment of further Centres of Excellence with innovative approaches and technology; this could be an important step in the further development of clinical and health research.



### 3.3 National and international collaboration

Collaboration within and across departments is undertaken by many of the research groups who were evaluated, but this pattern is very uneven. While cross-disciplinary collaboration is occurring in some places, there is much more potential here, for example in the collaboration between the basic sciences and clinical medicine, or between clinical medicine and epidemiology.

Even more uneven is the pattern of international collaboration. While some units have well-established and very productive links with the international research community, others have a surprising disinterest in sharing results or learning from others' results. When solid international contacts have been established they have often resulted in the highest quality research output. The research groups vary considerably in the numbers of international research visitors and of Norwegians who travel overseas for research and training attachments. The system of part-time employment as adjunct professor tends to be used more for movement within Norway than for the appointment of foreign researchers. Such isolationism and lack of international exposure contribute to Norway lagging behind the international community in some research fields and is extremely detrimental to the development of young researchers. Too many research groups still rely on projects that involve only one senior member without the participation of younger collaborators. Such an arrangement does not support opportunities for extended international travel or the international exchange of scientists.

#### **National and international collaboration: recommendations**

- Strengthen links with colleagues at other universities and institutes within Norway
- Support a tradition of spending at least some of the postdoctoral period abroad
- Encourage the maintenance of research links with laboratories and research groups outside of Norway
- Encourage senior researchers to use the sabbatical system to affiliations with research groups abroad
- Strengthen the international researcher exchange program

### 3.4 Organisation, leadership and strategic planning

The main settings for Norwegian research in the fields under evaluation are the universities, the clinical sector (hospitals) and the institute sector. This varies from some other countries that do not have an institute sector. Each of these sectors is organised, steered and financed differently from the others, thereby creating its own working culture and incentives.

Many of the research groups that were evaluated are very small and do not reach the critical mass for research purposes. This problem is exacerbated when such units function in isolation with little national or international interaction. In several departments, research is characterised by a large number of small and dispersed topics. This is a major problem when applying for research grants, as priority is often given to focussed collaborative studies. Strong scientific leadership is required to address this issue and reform the small groups into larger research structures.

Professional, dynamic and outward-looking leadership is essential to produce high quality research. The guidance and decision-making of a good scientific leader is indispensable in many aspects of research, such as the utilisation of human and economic resources, collaboration with other research units, the ensuring of adequate funding for the group as a whole, and the identification of new avenues of research that will put the group into the forefront. Appropriate leadership with management training is especially critical when faculties are undergoing major-structural changes, with smaller units merging into larger institutes. The results would be more strategic and focussed planning, with the setting of particular goals and identification of the needs to achieve those goals. Good leaders should be allowed to lead, while good researchers should be given the freedom to do research.

In at least some of the research groups under evaluation, the senior researchers appear to take little responsibility in teaching and encouraging good research practice, for example, with respect to project planning, study design, data analysis, and general attitudes to collaborative research. The roles and responsibilities of senior researchers are key issues for future research development.

While some research groups have good strategic planning, there is in general a lack of co-ordination in efforts to ensure integrated and complementary research profiles over a longer term for research groups who work on common topics. Even within individual research groups there are often diverse goals and an overall absence of longer term strategic planning that could connect differing interests into a cohesive research portfolio. In some areas, it seems that each PhD thesis is treated as project entity of its own, rather than being a logical part of the main research focus of the group. This adds to the impression of a scattered and diverse character of Norwegian research.

#### **Organisation, leadership and strategic planning: recommendations**

- Ensure that research groups are of sufficient size to allow multidisciplinary research environments with supportive infrastructure.
- Facilitate the process by which younger researchers can reach central research positions in order to increase the base from which future leaders can be recruited.
- More conscious selection of scientific leadership to ensure outward-looking and dynamic research leaders who have management training
- Encourage more strategic and focussed planning, with the setting of particular goals and identification of the needs to achieve those goals.
- Develop research themes that will draw different research units together in discussions of priorities, methodological approaches and interpretation of results.

### 3.5 Research staff and education

The older age distribution of the researchers in the fields under evaluation is a serious problem. A large number of senior staff are relatively old and there is only a small base of intermediate level researchers from which future leaders can be recruited. There are also few women in leading research positions, especially in the clinical research fields.

The rate of PhD dissertations is quite low in some research groups and, particularly in clinical fields, it is worrying that a research career appears not to be highly valued. A situation where academic salaries are considerably lower than clinical salaries does not encourage aspirations for a research career.

A PhD should be used to support and attract young individuals who have a curiosity in investigative medicine or health research. They should be supported in such a way that it is comfortable for them to undertake this work in a timely and focussed fashion rather than, for example, being forced to complete a PhD while also seeking to support themselves with clinical work. A detrimental consequence of this system is the relatively high age of clinically active physicians when they graduate with a PhD (43 years). The extended length of the PhD work time is such that cutting edge research is rarely accomplished.

#### **Research staff and education: recommendations**

- Interest in research needs to be developed at an earlier stage in education (for example, while still a student).
- PhD programs need to start earlier, preferably soon after graduation from university, and need to be shorter and more focussed.
- Senior staff should be more involved in supervision to promote a higher PhD output.

### 3.6 Staff recruitment and incentives for research

There are relatively few graduates in the many of the professions within public health research. This has resulted in many unfilled posts and training positions in the universities, as well as an overbalance of older researchers in some units. Norway's special geography with long distances between cities has also contributed to recruitment difficulties. Some groups outside of Oslo are very small, with vacant positions and teaching loads that prevent the establishment of convincing research programs.

Many of the research groups under review expressed their concerns about the difficulties of recruiting support staff, such as in bioinformatics and statistics. These arise partly from an insufficient number of graduates emerging with the relevant education, but also from negative incentives. As in other countries, Norwegian research institutions are faced with severe competition from other sectors where salaries in key disciplines are higher. Such a large salary differential gives a detrimental signal about the value of academic research and makes it harder to attract bright young minds to research positions. Alarming, the proportion of PhD students at Norwegian medical faculties who also have a medical degree has essentially been decreasing in all health sectors over the last 10 years. A culture change is required to bring research back into the centre of focus, with recognition of its crucial contributions to population health and efficient health care planning and its importance for the industry sector. Coordinated research programs of high scientific calibre are needed to attract bright young researchers who can see forward to conducting exciting and productive research with extensive collaborative links and held in high international regard.

#### **Staff recruitment and incentives for research: recommendations**

- Academic achievement deserves better than the current rewards, not only financially but also in terms of prestige and recognition.
- Adjust research salaries to improve recruitment of high quality staff back to the public sector and to ensure the emergence of new researchers over the next decade.
- Consider the establishment of focussed incentive programs to narrow the salary gap between the public and private sectors (for example, salary bonuses for workers in underserved disciplines, one-off sign-on bonuses for academic posts).
- Award academic merit to consultative research and statistical support that is provided to other research groups.
- Pay special attention to areas where the Norwegian context offers unique research potential
- Encourage the development of coordinated and problem-oriented research programs that will attract young researchers and provide motivation for collaborative and international research.

### 3.7 Publication output and bibliometric results

With some clear exceptions among the research groups that were evaluated, too many local publications in Norwegian are being produced. In contrast, too few studies have been published in high-impact international journals. This is related to the general lack of international exposure through international research cooperation.

Bibliometric data can be useful in determining the contribution that is made to the international literature. A report provided to the evaluation panels (D.W. Aksnes, Medical research in Norway – bibliometric indicators, NIFU skriftserie nr. 9/2003) concludes that Norway makes a relatively high contribution in the clinical medicine (that here includes public health) and psychology/psychiatry fields, with 30-40% of the publications being co-authored by researchers from abroad. The citation rates in clinical medicine are also higher than the world average. However, when compared to other Nordic countries the citation frequencies of Norwegian research papers have not been following the same pattern. While in Denmark, Finland and Sweden the relative citation frequencies have been steadily increasing, in Norway they have started to lag behind, especially during the last 10-15 years. While bibliometric information is relevant, great care should be taken when using it. It is clear that a few good research areas with extensive collaboration and publication are pulling up the rest of the research field. An important factor is the relative impact level of the journal in which the publications appear. Bibliometric results are therefore an important element, but not one that should be used alone in the assessment of the quality of research.

#### **Publication output and bibliometric results: recommendations**

- Maintain the important role of communicating research results to the greater Norwegian society but ensure that this is not to the detriment of international publication.
- Encourage more publications in international peer-reviewed journals.
- Ensure greater international exposure through working contacts and international conferences.
- In the evaluation of grant applications, include assessment of the quality of the journals published in as well as citation rates.

## 4. SUMMARY

This report describes some main structural issues that appear to be problematic in the development of clinical and health research in Norway. The members of the Joint Committee have identified these problems during an evaluation process that has involved a large number of research groups working in a broad range of fields – including clinical, biomedical, epidemiological, public health, health-related, psychiatric and psychological research. This report does not deal with issues related to the quality and relevance of the research undertaken in these fields – it was considered that such issues are specific to the different research fields and should be read in the context of each panel's work. The reader is therefore referred to the three separate reports that comments on the quality, relevance and management of the research undertaken in the research fields evaluated.

While the Joint Committee believes that the structural problems described here are common to all of the fields evaluated, the research fields (and research groups) vary in their recognition of and reaction to these problems. The evaluation panels have seen many examples of excellent work being conducted in these fields, where effective leadership, strategic research planning, broad collaboration and a high standard of expertise have all been brought together to produce dynamic and highly regarded research groups. There are many other cases, however, where this is not the case. The Joint Committee believes that a number of fundamental structural problems exist that need to be recognised and dealt with before Norwegian research in general in these fields can develop to its full potential. The main problems, which are only briefly summarised here, are perceived to be the following:

- Too low funding for clinical and health research
- Inadequate infrastructure with limited access to specialist support and/or equipment
- Lack of coordinated and interdisciplinary research
- Insufficient international collaboration
- Too many small research units
- Scientific leadership is not strong enough
- Inadequate international publication

It is hoped that the comments made here will be seen as constructive and relevant and will be a positive contribution in the further development of a high and internationally competitive research standard in clinical and health research in Norway.

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## Appendix 2. Terms of reference for the Joint Committee

### Joint Committee for the summary findings and recommendations from the three evaluation panels

#### Terms of reference

## I Introduction

The objective of the evaluation of clinical, epidemiological, public health, health-related and psychological research in Norway is to review the overall state of this research in Norwegian universities, university hospitals and relevant research institutes in order to provide a basis for future strategies of the Research Council in the area of medicine and health research.

This broad-based evaluation has involved the work of three independent evaluation (expert) panels. Their assessments and recommendations will be compiled in three separate reports. Hopefully, these reports will give important input to the individual research institutions, to the Research Council and to any other bodies involved in the development of Norwegian research.

In order to provide an overall assessment - with general recommendations at a national level - the Research Council has also asked for a summary report that compiles major general findings and recommendations from the three evaluation (expert) panels.

#### Organisation

The Joint Committee has six members, two from each of the appointed evaluation panels (Panel 1 Clinical research, Panel 2 Public health and health services research, and Panel 3 Psychology and psychiatry).

## II Mandate for the Joint Committee

The Joint Committee is requested to compile a summary report based on the assessments and recommendations from the three independent panels.

This report should offer an overall assessment of the state of the research involved. The report should also offer a set of overall recommendations concerning the future development of this research.

The Joint Committee is requested to:

1. Summarize the overall scientific quality and relevance of Norwegian clinical, epidemiological, public health, health-related and psychological research. Identify which research areas have a particularly strong scientific position in Norway, in a national and international context, and which are particularly weak? Considering the scientific importance of research performed, is there a reasonable balance among the individual research fields?
2. Summarize general assessments related to the institutional structure and situation for Norwegian clinical, epidemiological, public health, health-related and psychological research, calling attention to any areas that need special attention. Are there specific institutional features that may enhance or hinder growth and development of Norwegian research and Norway's contribution to the international knowledge base? Are there features of the recruitment process that warrant special attention?
3. Summarize the overall situation for financial support for Norwegian clinical, epidemiological, public health, health-related and psychological research. Is the funding situation adequate? Are there any recommendations regarding changes in the distribution of financial support?
4. Summarize the overall interchange of knowledge production and technology development and commercialization, as well as the use of the knowledge production for clinical or policy purposes regarding the research in these areas. What are the major challenges to the use of research results in a fruitful manner?
5. Are there other important aspects of Norwegian clinical, epidemiological, public health, health-related and psychological research that ought to be given special consideration on a national or international level?

The Joint Committee's conclusions should lead to a set of recommendations for the future development of Norwegian clinical, epidemiological, public health, health-related and psychological research.



