



Vetenskapsrådet

## EVALUATION OF THE PANEL REORGANISATION IN THE SCIENTIFIC COUNCIL FOR MEDICINE



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FOR MEDICINE**

Ulf Pettersson, Janna O. de Boer and Rolf K. Reed

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# PREFACE

The mission of the Scientific Council for Medicine (SCM)<sup>1</sup> within the Swedish Research Council is to support Swedish medical research of the highest quality. The SCM reviews, evaluates, and prioritises applications through peer review by the research community, a process that must be transparent and open to scrutiny. The SCM's legitimacy as an evaluator of medical research in Sweden is based on the confidence that it enjoys among researchers in this context.

Research in Sweden is still largely organised in terms of faculties and takes place in defined disciplines. To date, medical research has been highly successful under this organisation. Increasingly, however, research requires collaboration on a wider scale among researchers from different research fields and with different research backgrounds. To accommodate this transition, and to address the increasing workload for reviewers resulting from a 60% increase in the number of applications between 1999 and 2003, a new review organisation was established in 2005. The reorganisation was based on the report from a working group appointed by the SCM.

The new organisation for grant evaluation abandoned the previous system (i.e. 13 individual, method-based evaluation panels) in favour of a more flexible model where the number of applications received would determine the number of evaluation panels. The evaluation panels were grouped, to the extent possible, according to diagnostic areas, spanning from molecular investigations to cohort studies. When the decision was made to reorganise the evaluation panels it was decided to evaluate the new review panel organisation after three years of operation.

This is the report by the external committee appointed by the SCM to evaluate the new panel organisation. The evaluation was performed from January to September 2009. Committee members included: Ulf Pettersson (Chair) Professor of Medical Genetics at Uppsala University and former Vice Rector; Janna O. de Boer, PhD (dr.) and Msc (ir.) in Human Nutrition, PhD in Epidemiology, ZonMw management team, Netherlands organisation for health research and development; and Rolf K. Reed, Professor of Physiology and Head of Department of Biomedicine at the University of Bergen in Norway.

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<sup>1</sup> As of January 2010, the Scientific Council for Medicine is replaced by a Scientific Council for Medicine and Health.

The evaluation aims to address the effect of the new panel organisation on the applicants, the reviewers, the SCM, and the administrative personnel at the Swedish Research Council. The results show clear advantages for the revised panel organisation, but the evaluation also presents recommendations for further development. It is essential for funding organisations such as the Swedish Research Council to continuously monitor their peer review processes. Thereby, the cornerstone of funding for basic research, i.e. the core values of peer review (scientific competence, fairness, and integrity) can be constantly maintained and developed.

Stockholm in February 2010

Karin Forsberg Nilsson

Deputy Secretary General

Swedish Research Council, Medicine and Health

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# EXECUTIVE SUMMARY

This evaluation reviews the new panel organisation that has been in operation since 2006 at the Scientific Council for Medicine (SCM). When the decision was made to reorganise the evaluation panels it was also decided to evaluate the new review panel organisation after three years of operation. Important reasons for the re-organisation of the peer review panels included: (1) to increase visibility of the impact of basic (bio)medical science in curing disease and improving medical practice (2) to handle the increasing load of applications, and (3) to adopt a new conflict-of-interest policy. A committee appointed by the SCM performed the evaluation between January and August 2009. The conclusions and recommendations are based on questionnaires, interviews, and information from the SRC database.

Although the revised panel organisation clearly has some advantages, it also has some disadvantages. It is recommended that the basic structure of the organisation be maintained, but that with certain modifications. A strong argument for maintaining the organisation is that translational work is anticipated to increase in the near future.

The evaluation committee (EC) would like to recommend the following changes related to workload, expertise and designation of the panels, partiality, and quality of feedback on decisions.

## Workload

- The panel reform has reduced the number of applications per panel member, but the range is too wide (from <40 to nearly 80).
- The number of panels or panel members per panel should increase to maintain a reasonable workload for the panel members.
- The decision that each panel member does not read all applications is a reasonable means to decrease the workload. In large panels it might be appropriate to allow additional persons to read only the abstracts.
- The triage process appears to work well and to be well accepted and should be maintained. It is recommended that a follow-up study be conducted later to ascertain that no proposals were rejected due to lack of expertise among the evaluators.
- Other options include a pilot with continuous submission, which would spread out the work over the year and might reduce the number of applications.

## Expertise and panel designation

- Panels lacking sufficient expertise to evaluate certain applications should be encouraged to send applications to external reviewers for a written review.
- The already approved decision that panel organisation should be flexible and adapt to the application pressure should be implemented.
- Rather than having parallel panels (three for disease mechanisms and two for public health and nursing) it is suggested that the panels be given individual profiles to promote competition on equal terms.
- The SCM should consider whether to include new panels, e.g. a panel to handle cancer applications.
- Given that the interviews indicated that there is a feeling in the scientific community that the SCM primarily wishes to support applied medical research, it is essential to communicate that the SCM expects and welcomes applications for basic research. In some cases, panel designations should be changed to make it clear that the disease-oriented panels welcome basic research applications.
- The approval rates in different panels show an unexpected variation (range <20% to nearly 50%). It is recommended that the SCM look into this since it may reflect differences in resource allocations to different subject areas.

## Partiality

- The decision to include scientists from the Nordic countries was wise and could be expanded, perhaps beyond the Nordic countries.
- The privilege for the applicants to recommend review panels might be reconsidered.
- The SCM might consider having a pool of reviewers and assemble the panels when the applications have arrived at the Council.
- It is recommended that the SMC earmark a specific sum of money for young investigators to give them a fair chance to compete for resources. The current evaluation system appears to put young applicants without a long track record at a disadvantage.

## Quality of feedback on decisions

- Feedback to applicants needs to be improved. This is a critical component in an evaluation process and plays an important educational role, particularly for young investigators. It also brings transparency to the evaluation process.



# BACKGROUND

Research in Sweden is still largely organised in terms of faculties and takes place within defined disciplines. Medical research has been highly successful with this organisation. Increasingly, however, medical research requires collaboration on a wider scale between researchers from different research fields and with different research backgrounds. After the turn of the century it became obvious that the review panel organisation for medical research funding at the Scientific Council for Medicine (SCM) needed to be reviewed to improve the prospects of conducting research aimed at combating illness and improving human health. Many countries organise medical research and research funding in more outcome-oriented ways, and this was one aspect that the SCM intended to investigate.

Internationally, research funding organisations have experienced a steady increase in applications. This is also true in Sweden. Between 1999 and 2003 the SCM reported a 60% increase in project grant applications, and subsequently the workload of the 80 experts on the 13 review panels increased.

The Swedish Research Council (SRC), created in 2001 by merging the former Scientific Councils, is the largest state body providing funds for basic research in Sweden. It emphasises innovation, development, and attaining the highest quality. The *raison d'être* for the SCM at the SRC is to support the most promising and meritorious medical research in Sweden. This encompasses research in medicine, odontology, pharmacology, public health, and care sciences. The SRC reviews, evaluates, and prioritises applications through peer review by the research community, a process that is transparent and open to scrutiny. Its legitimacy as an evaluator of medical research in Sweden is based on the confidence it enjoys among researchers. Peer review is the standard, internationally accepted method of assessing the quality of grant proposals.

In 2004, the SCM appointed a working group (WG) to generate suggestions on how to best evaluate applications for translational and multidisciplinary research and how to improve the review panel organisation. The WG was assigned to suggest a new review panel organisation that would take into account the needs to:

- Promote translational and interdisciplinary research
- Adjust to the current input of research applications
- Adapt to the Director General's decision that scientists applying for project grants cannot take part in the review panel.

A prerequisite was to maintain the current size of the review organisation.

The WG delivered its final report in April 2005. It recognised that the main mission of the SCM is to support investigator-initiated research projects and allocate funds according to scientific quality and activity. Concurrently, it needs to identify how the research areas chosen by the scientists relate to the burden of disease in society, both in Sweden and globally.

The WG considered that translational aspects spanning from basic mechanisms to patient applications are increasingly important in modern medical research. To best evaluate the proposals for funding in medicine, a review panel needs both clinical and experimental expertise. One way to fulfil this requirement is to group the applications, to the extent possible, in disease categories and construct new evaluation panels based on such a strategy. The WG put forward this conclusion in its final report, which presented suggestions for new divisions and subdivisions of evaluation panels. Also, the WG recognised that some applications would not easily fit within disease categories, and therefore suggested that panels for basic disease mechanisms should be included. Furthermore, the WG suggested that while the size of the panels should remain the same, the number of panels must be increased. This would meet the dual requirements of decreasing the workload on the reviewer and allow parallel panels to handle the new conflict-of-interest policy.

## Decisions for panel reform

The Scientific Council for Medicine (SCM) decided on September 27 and November 29, 2005 to organise the evaluation panels in a new way, starting in 2006. The new organisation for grant evaluation abandoned the previous system of 13 evaluation panels and replaced it with a more flexible model whereby the number of applications received would determine the number of evaluation panels. The SCM decided that, starting in 2006, most of the new evaluation panels should be more clearly divided into disease categories. Hence, the evaluation panels were divided into three main groups: 1) disease categories, 2) basic disease mechanisms, and 3) public health and care sciences. Another change, in accordance with the new conflict-of-interest policies of the Swedish Research Council, was that members of evaluation panels who are also grant applicants may not participate in the evaluation process. Under the previous system, panel members served for six consecutive years. From 2006, a panel member who submits a grant application may not participate in the evaluation process during that year, but may return to the panel the following year. The combined term of service will continue to be six years.

Since the new evaluation organisation was larger it required more reviewers. Suitable reviewers were to be identified by collaborating with the research councils in the other Nordic countries. Hence, Norwegian, Finnish, Danish, and Icelandic researchers are now included on the evaluation panels.

The key points of the decision include:

1. The evaluation panels are divided into three main divisions as outlined above.
2. Evaluation panels should be organised dynamically according to the number of applications and the subject profile of the incoming applications.
3. Applicants may suggest which panel should evaluate his/her application.

## The evaluation

The evaluation committee (EC) was composed of the following members:

*Ulf Pettersson (Chair)*

Professor of Medical Genetics, Uppsala University, Sweden, and former Vice Rector of Uppsala University

*Janna O. de Boer*

PhD (dr.) and Msc (ir.) in Human Nutrition, PhD in Epidemiology. Management ZonMw, Netherlands Organisation for Health Research and Development, Manager Team Science and Innovation, Netherlands

*Rolf K. Reed*

Professor of Physiology, Head of Department of Biomedicine, University of Bergen, Norway

SRC staff assisted the EC throughout the process with documentation, administrative support, information gathering, and logistics for panel communication. The evaluators express their grateful appreciation to the SRC personnel for their excellent service.

## Project aim

The project aimed to evaluate the review panel reorganisation, as decided by the SCM and the SRC in 2005. The evaluation considered the effect of the

new panel organisation on applicants, reviewers, the SCM, and administrative staff of the SRC.

## Methodology

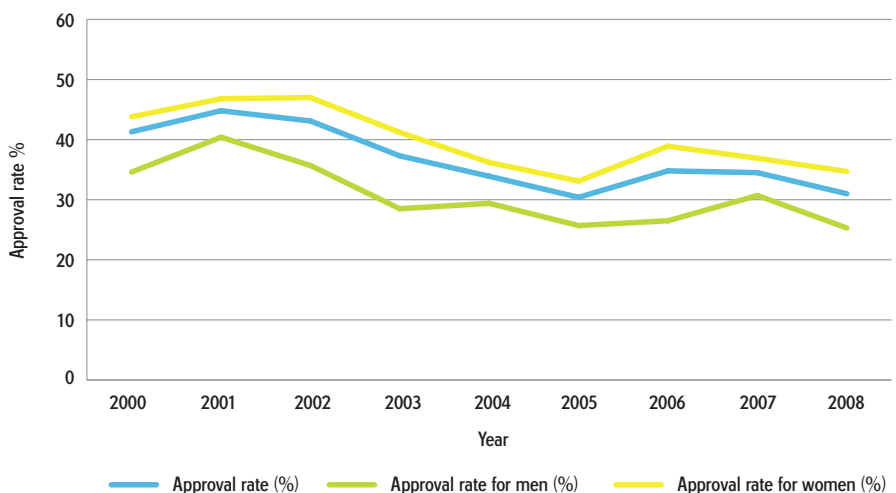
The evaluation was based on a combination of questionnaires and interviews. Interviews were conducted along several lines and involved several groups that play different roles in the peer review process. Interviews of these groups were conducted by the entire EC. The largest group consisted of scientists (as applicants and as reviewers on panels). Panel chairs perform a key task in the evaluation process and were interviewed separately. Furthermore, two representatives of the SRC staff who handle the administrative process were interviewed about the new panel system. In addition to the interviews, the SRC database was used to collect data on application numbers, panel workloads, and success rates.

# APPLICATION LOAD, PANEL DISTRIBUTION AND SUCCESS RATES 2000–2008

As a starting point for discussion about the panels, data on application numbers, panel workloads, success rates, and career ages of applicants were collected from the three years that the new panel system had been in operation (2006–2008) and compared to the six years prior to the change (2000–2005). Figure 1 shows the approval rate for project grant applications. For the first three years of the study, the approval rate was 40% to 45%, but has since decreased to around 35%. The strategy of Scientific Council for Medicine (REF) has been to increase the amount of funding for the projects selected for support, not the number of projects supported. To achieve the objective of substantially increasing the average size of project grants, the number of projects could not increase unless the available budget increased, which was not the case until 2006. The application load, on the other hand, increased by approximately 60% between 2000 and 2005, and as a consequence the approval rate decreased.

The overall approval rate, when not adjusted for career age, was lower for women than for men (Figure 1A).

FIGURE 1A. Overall approval rate.



When adjusted for time lapsed since receiving a PhD, the differences become slightly less, i.e. the expected approval rate in 2008 was 28.1% for women and 34.5% for men, while the actual approval rate was 27.0% for women and 35.2% for men. This is because the group of men applying for project grants, in general, have a longer scientific career than the group of women applicants. The gender differences become smaller when analyzing competitive renewals and new grant applications separately, as shown in figures 1B and 1C. Competitive renewals overall have higher approval rates than new applications. Figure 2A shows the profile of applicants for project grants in relation to career age, with a peak in applications from scientists six to ten years after receiving their PhD. The approval rate increases with the number of years after the PhD (Figure 2B). These parameters have not changed substantially over the three years that the new panel system has been in operation.

FIGURE 1B. Approval rate for competitive renewal.

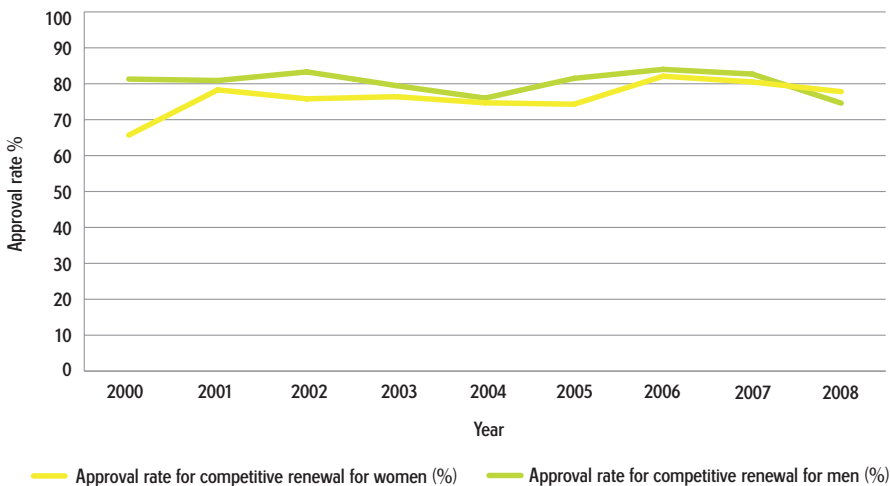


FIGURE 1C. Approval rate for new applications.

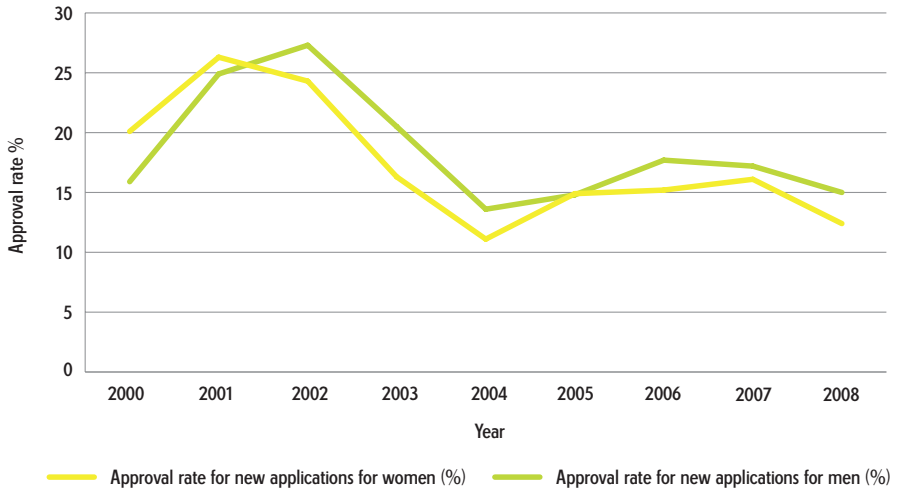


FIGURE 2A. Applicant age distribution (years after PhD).

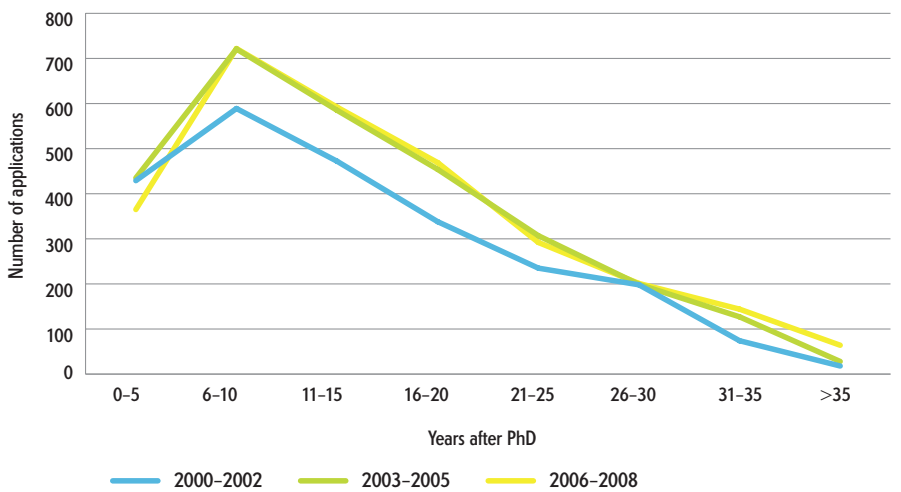


FIGURE 2B. Applicant rate for age categories.

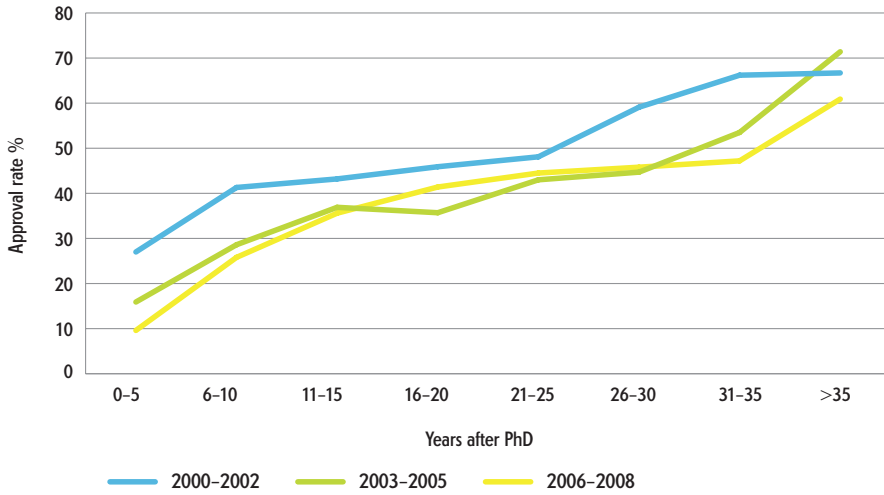




FIGURE 3A. Number of project grant applications per evaluation panel.

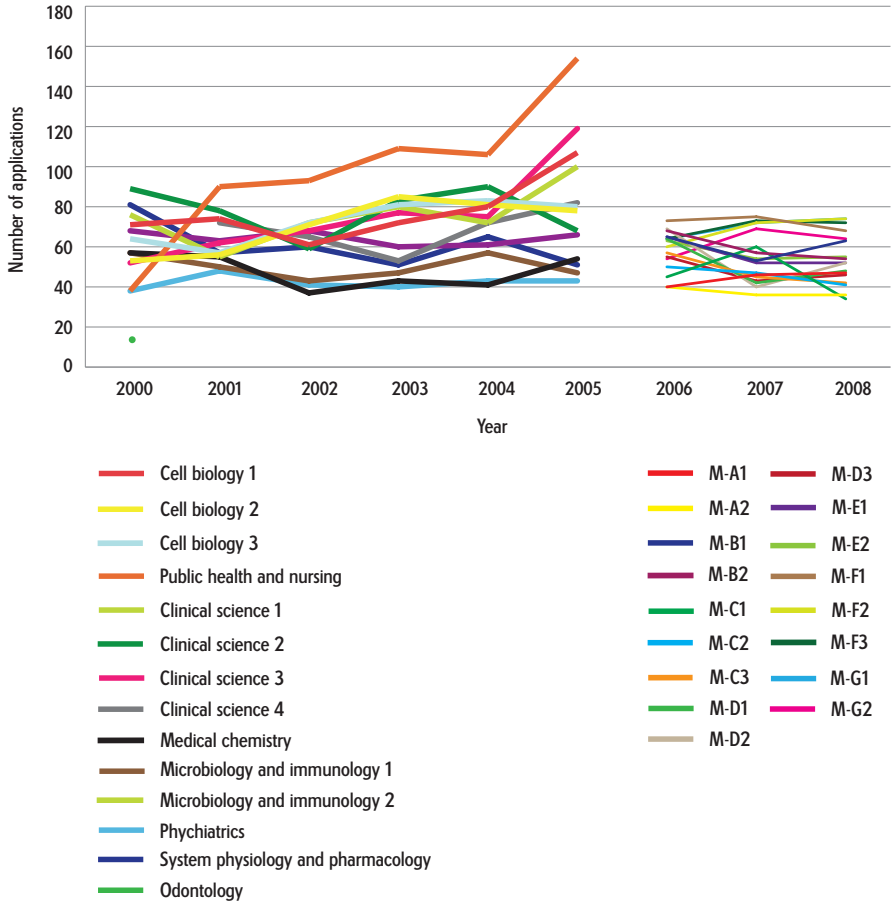


Figure 3A presents the number of project grant applications reviewed by each evaluation panel before panel reorganisation (2000–2005) and after panel reorganisation (2006–2008). The volume ranged from 34 to 75 applications. In addition to reviewing project grant applications, the evaluation panels also score applications for Junior Research Positions. Figure 3B presents the approval rate per evaluation panel before panel reorganisation (2000–2005) and after panel reorganisation (2006–2008).

FIGURE 3B. Approval rate per evaluation panel.

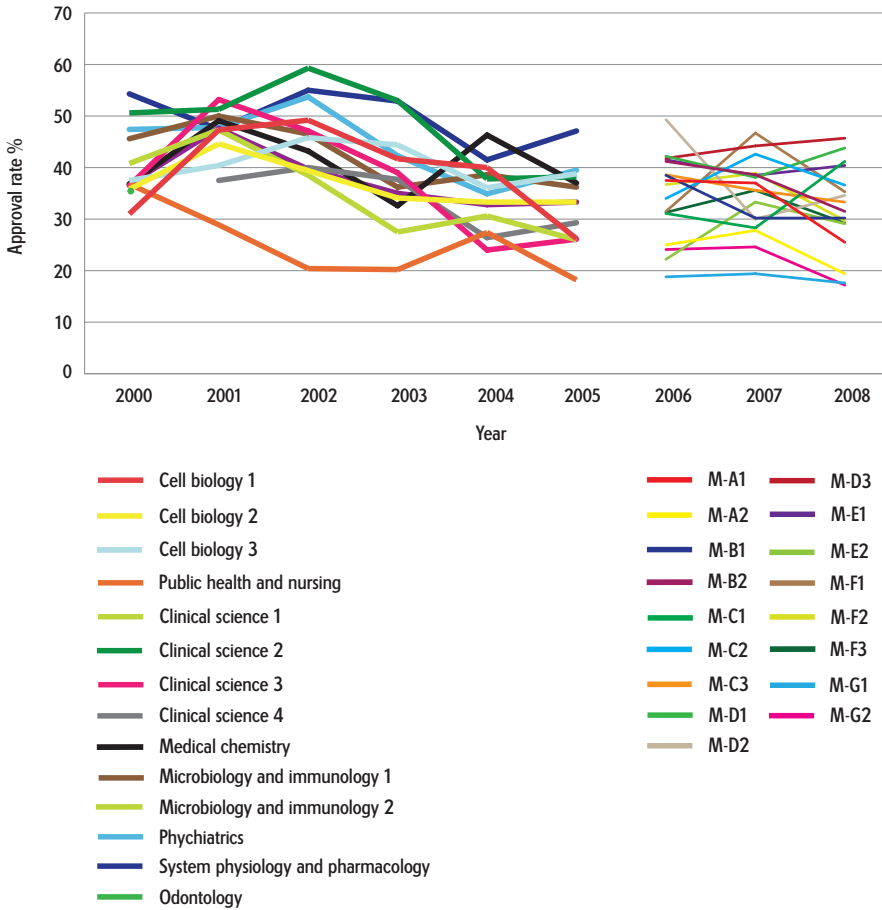


Figure 4A shows the numbers of applications within specific subjects by three-year intervals, and Figure 4B presents the distribution of subject areas. At the time of application, the applicants chose their area from a list of subject areas. The major changes over the years examined are increases in applications in cancer and public health. In 2004, the SCM announced that the previous consultation with the Swedish Cancer Society concerning applications had ceased, and scientists were welcome to submit applications to both funding bodies. The increase in project grant applications in cancer could represent either a real increase in the numbers or a re-distribution of subject area by the applicant due to this announcement, or a combination of both. The doubling of applications in public health between 2003-2005 and 2006-2008 has no similarly obvious underlying cause.

Figure 4C presents the approval rate for applications in each subject area. As discussed above, the overall approval rate decreased over the years examined. It is difficult to draw conclusions on variations in subject areas with few applications, but the larger subject areas (i.e. >100 applications) show little or no difference between 2003-2005 and 2006-2008 in relation to the generally lower rates. The exceptions among the larger areas are public health and, to some extent, nursing (now called care sciences to conform with international terminology) where the approval rates remain below the average level.

FIGURE 4A. Number of applications within specific subject areas.

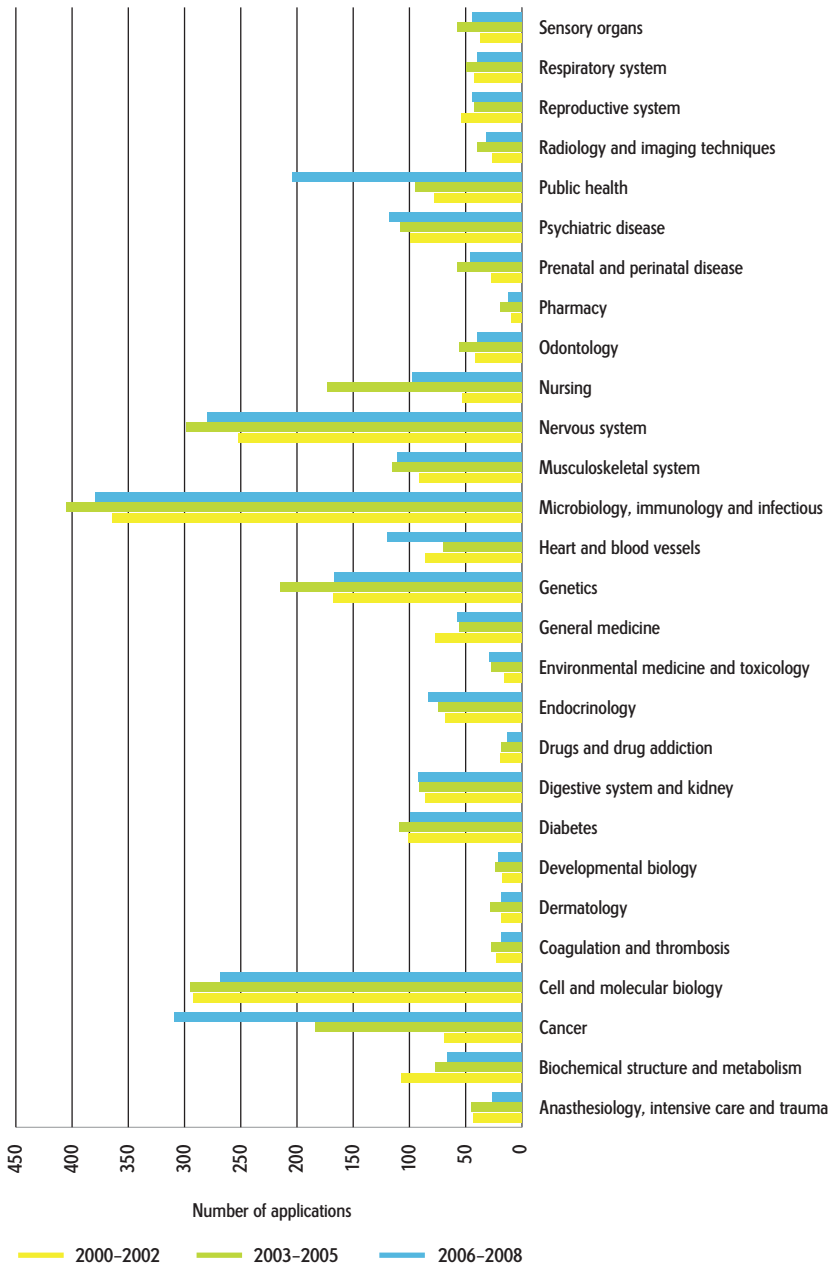


FIGURE 4B. Distribution of applications in subject areas (%).

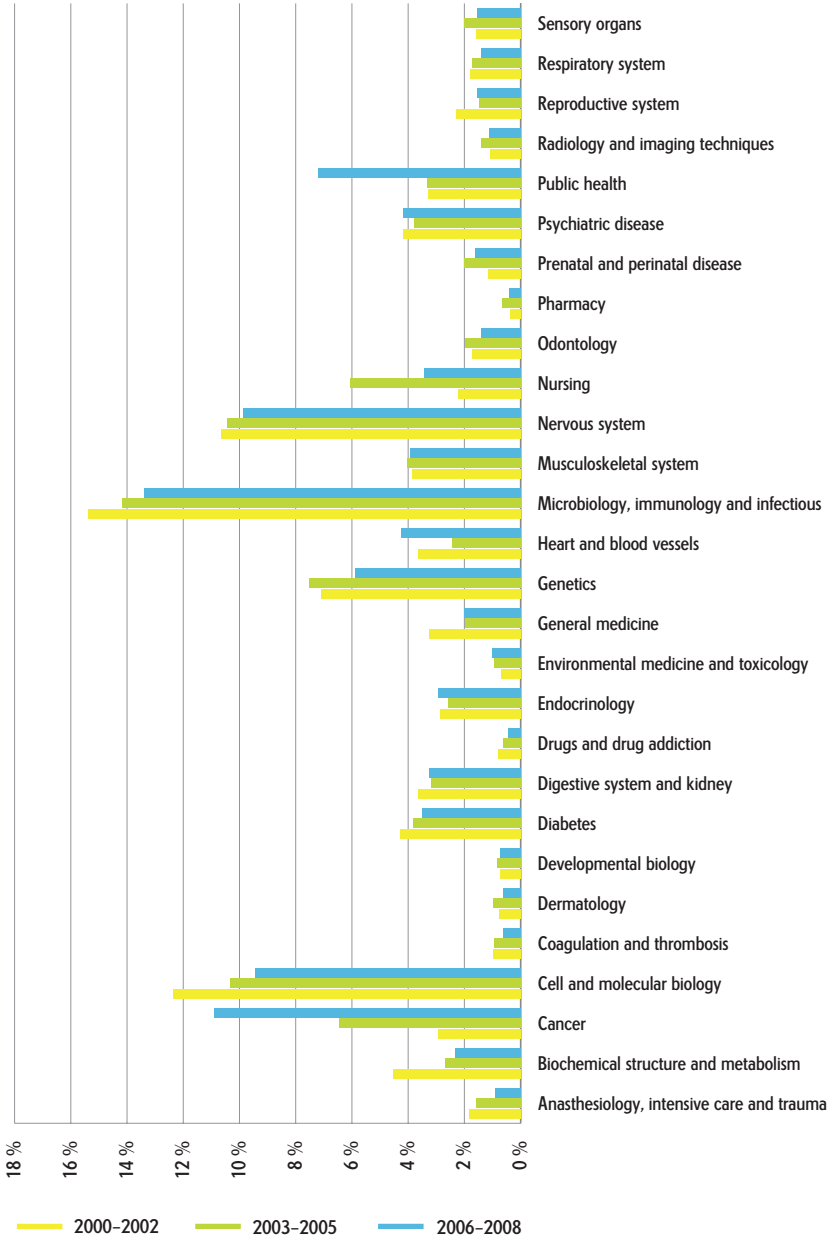
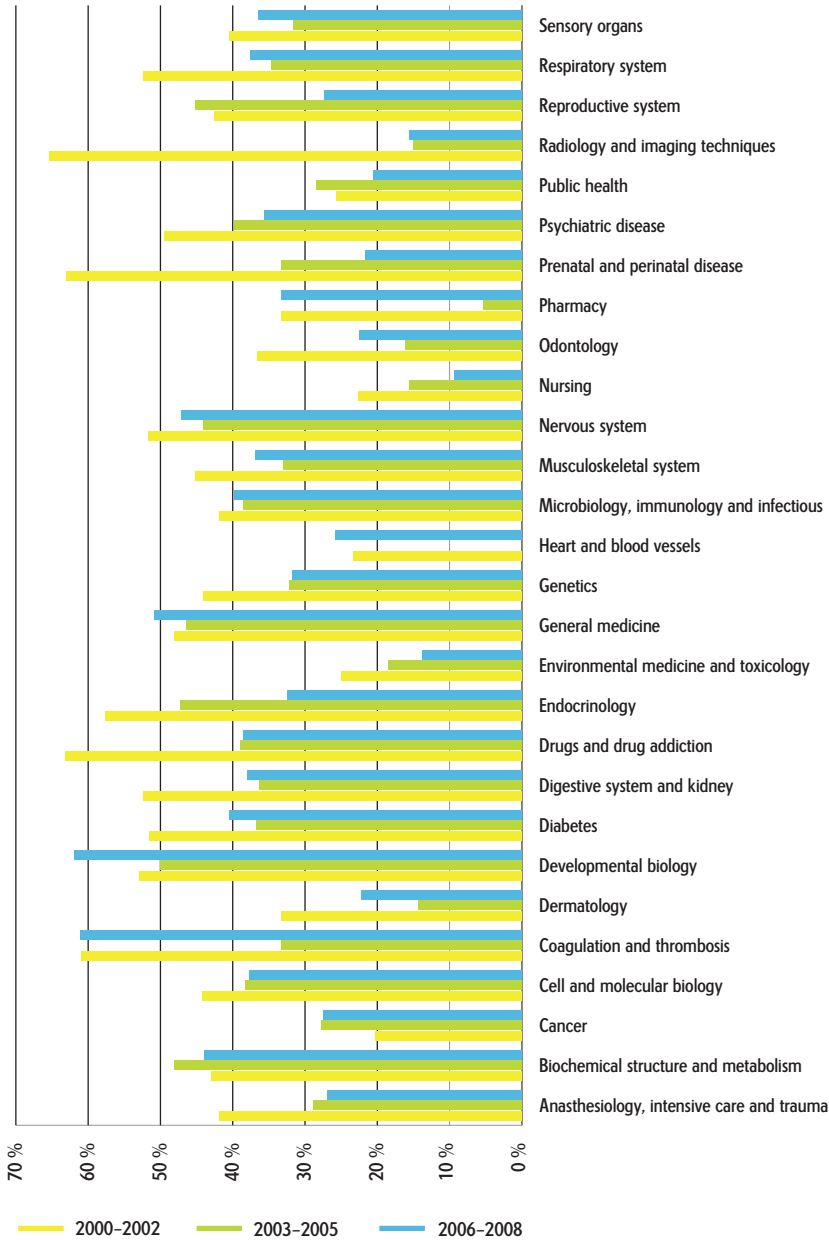


FIGURE 4C. Approval rate within subject areas.



# CONCLUSIONS FROM THE QUESTIONNAIRES TO APPLICANTS

The panel devised a set of questions for a Web-based survey, which was sent to those who applied for a project grant from the Scientific Council for Medicine (SCM) during the period 2006 to 2008. In total, 2166 surveys were sent out and 1204 responses (55% response rate) were received. Of the responders, 54% had been successful with their applications. The gender distribution of applicants was 62% male and 38% female. Of the responders, 33% had received their PhD less than 10 years ago, 40% between 11 and 20 years ago, 17% between 21 and 30 years ago, and 9% more than 30 years ago. These figures are proportional to the number of scientists in the different age groups. Hence, the response rate was representative of the proportion of career ages of those applying for grants at the Swedish Research Council (SRC) during the years investigated. Responders were categorised into two groups; those whose application was approved (645 responders) and those who did not receive a project grant (548 responders).

The first question related to the overall impression of the quality of the assessment (Table I). Of the responders, 53% scored the quality of the assessment as good, 20% scored it as less than good, and 26% were indifferent. A clear distinction appeared in how the successful and unsuccessful responders rated the quality of the assessment process. Of the successful applicants, 74% scored the process as good or very good, whereas 29% of the unsuccessful applicants gave these scores. Regarding problems related to the applicants' choice of panels, the survey did not reveal any major differences before and after the panel reform (Tables 2 and 3). Concerning possible changes in confidence in the evaluation process, the responses (Tables 4 and 5) were neither positive nor negative (9% reported higher and 17% lower confidence). There appears to be a decrease in confidence in the age groups that received their PhD a longer time ago. The question about feedback to applicants received the worst scores, with as many as 30% dissatisfied (Table 6). However, when the responses were stratified based on success in the application outcome, the unsuccessful applicants clearly represented the overwhelming majority of critical responders.

TABLE 1.

The last time you applied for a project grant, was your application approved?

	Yes	No	Total
What is your overall impression of the quality of the assessment of your application?	Responses	Responses	Responses
Very good	199 (30.9%)	33 (6.0%)	232 (19.4%)
	280 (43.4%)	124 (22.6%)	404 (33.9%)
Neither good nor bad	111 (17.2%)	200 (36.5%)	311 (26.1%)
	28 (4.3%)	90 (16.4%)	118 (9.9%)
Very bad	10 (1.6%)	75 (13.7%)	85 (7.1%)
No opinion	17 (2.6%)	26 (4.7%)	43 (3.6%)
Total	645 (100.0%)	548 (100.0%)	

TABLE 2.

The last time you applied for a project grant, was your application approved?

	Yes	No	Total
Was it easy or difficult to suggest an evaluation panel for the review of your application?	Responses	Responses	Responses
Very easy	99 (15.3%)	25 (4.6%)	124 (10.4%)
	178 (27.6%)	86 (15.8%)	264 (22.2%)
Neither easy nor difficult	178 (27.6%)	165 (30.3%)	343 (28.8%)
	101 (15.6%)	128 (23.5%)	229 (19.2%)
Very difficult	41 (6.3%)	68 (12.5%)	109 (9.2%)
No opinion	49 (7.6%)	72 (13.2%)	121 (10.2%)
Total	646 (100.0%)	544 (100.0%)	



TABLE 3.

The last time you applied for a project grant, was your application approved?

	Yes	No	Total
If you have applied for grants from the Scientific Council for Medicine before 2006: Did the reorganisation of the evaluation panels make it easier or more difficult to suggest an evaluation panel for the review of your application?	Responses	Responses	Responses
Much easier	16 (2.5%)	9 (1.7%)	25 (2.2%)
	68 (10.7%)	27 (5.2%)	95 (8.3%)
Neither easier nor more difficult	264 (41.6%)	168 (32.6%)	432 (37.6%)
	79 (12.5%)	42 (8.1%)	121 (10.5%)
Much more difficult	45 (7.1%)	34 (6.6%)	79 (6.9%)
No opinion	162 (25.6%)	236 (45.7%)	398 (34.6%)
Total	634 (100.0%)	516 (100.0%)	

TABLE 4.

The last time you applied for a project grant, was your application approved?

	Yes	No	Total
Has your confidence in the evaluation process carried out by the Scientific Council for Medicine been affected by the changes in the structure of the evaluation panels?	Responses	Responses	Responses
Yes, my confidence has increased	87 (13.6%)	16 (3.0%)	103 (8.7%)
Neither increased nor decreased confidence	372 (57.9%)	229 (42.4%)	601 (50.8%)
Yes, my confidence has decreased	83 (12.9%)	112 (20.7%)	195 (16.5%)
No opinion	100 (15.6%)	183 (33.9%)	283 (23.9%)
Total	642 (100.0%)	540 (100.0%)	

TABLE 5.

## How many years ago were you awarded your PhD?

	0–10 years ago	11–20 years ago	21–30 years ago	More than 30 years ago	Total
Was it easy or difficult to suggest an evaluation panel for the review of your application?	Responses	Responses	Responses	Responses	Responses
Yes, my confidence has increased	30 (7.6%)	49 (10.2%)	17 (8.2%)	8 (7.5%)	104 (8.8%)
Neither increased nor decreased confidence	185 (47.0%)	259 (54.1%)	108 (52.2%)	54 (50.5%)	606 (51.1%)
Yes, my confidence has decreased	40 (10.2%)	75 (15.7%)	47 (22.7%)	33 (30.8%)	195 (16.4%)
No opinion	139 (35.3%)	96 (20.0%)	35 (16.9%)	12 (11.2%)	282 (23.8%)
Total	394 (100.0%)	479 (100.0%)	207 (100.0%)	107 (100.0%)	

TABLE 6.

## The last time you applied for a project grant, was your application approved?

	Yes	No	Total
How well does the evaluation/feedback (grading and written evaluation) of your application reflect a trustworthy and competent assessment, in your opinion?	Responses	Responses	Responses
Very well	127 (19.7%)	22 (4.0%)	149 (12.5%)
	268 (41.5%)	105 (19.3%)	373 (31.3%)
Neither well nor badly	138 (21.4%)	132 (24.2%)	270 (22.7%)
	65 (10.1%)	151 (27.7%)	216 (18.1%)
Very badly	29 (4.5%)	113 (20.7%)	142 (11.9%)
No opinion	19 (2.9%)	22 (4.0%)	41 (3.4%)
Total	646 (100.0%)	545 (100.0%)	

In conclusion, the survey does not reveal any dramatic effects. The most disturbing result, however, is that confidence in the review process if anything has decreased slightly. The clearest result concerned the dissatisfaction with feedback, and here the SCM needs to improve performance to maintain its good reputation.

In addition to interviews with panel members conducted by the panel(committee?), questionnaires were sent in 2007 and 2008 to those who participated in the review process. Appendixes 1 and 2 present the results of these questionnaires.

# IMPRESSIONS FROM THE INTERVIEWS

The evaluation committee (EC) interviewed two persons from the Scientific Council for Medicine (SCM) staff who both had participated in panel meetings and who had experience both from the 'old' and the 'new' organisation. Both were pleased with the new organisation and felt that everything now worked smoothly. Their impressions from the discussions within the panels were that the discussions were good, and that it was fairly easy to reach conclusions and consensus. Their unanimous opinion was that they do not want to change back to the old system.

The EC also interviewed two architects of the new panel organisation. They confirmed that the reorganisation was prompted by difficulties in the old organisation to evaluate interdisciplinary research properly, and that the old panels did not reflect the structure of current (bio)medical and health research. They also felt that a political issue was involved and saw a need to convince the public that society benefits from medical research funded by the SCM. An issue that was raised in the interview concerned the panel designations, as these did not always appear to be rational (e.g. the same panel covered anaesthesiology and musculoskeletal diseases), and some panels included subjects that were not closely associated (gastroenterology and endocrinology). The EC was informed that the panel designations were based on an in-depth study that had been conducted of all applications received by the SCM the years before the panel change. An important issue in the reorganisation was to promote interdisciplinary work. Hence, it was recommended panels should be assembled which included expertise ranging from basic science to clinical medicine. Originally, it was hoped that these broad panels could also handle applications from public health and the care sciences. Later, however, the opinion was that public health and the care sciences might be at a disadvantage in such multidisciplinary panels due to the specific expertise needed to judge these types of applications. The WG also recognised that it was necessary to maintain at least a few panels to deal with research that could be argued to necessarily have an immediate or obvious connection to any disease, but which nevertheless broaden the understanding and knowledge base for the normal function and through this the basis for better understanding disease mechanisms as well as opening up new diag-

nostic and treatment possibilities. The representatives of the working group felt that the Council in its final decision did not fully implement the efforts suggested by the group. The final result was that five panels were reserved for research not linked to any specific disease (three covering molecular, cellular, and biochemical aspects and two covering public health and care sciences). The current panels, however, could not easily accommodate applications on the study of functions in the normal body or in model organisms.

Panel members constituted another category of interviewees. From a list of panellists, the EC selected a group that represented all different panels. Unfortunately, several of the invited panellists were unable to attend, so the final group was comprised of seven panel members. The interview yielded some unexpected insights. A fairly severe critique was brought forward against some effects of the panel reform. Several of the representatives felt that the SCM was failing in its mission to support basic research since all panels were in some way oriented towards specific diseases or disease mechanisms. The point was raised that a common notion among basic researchers was that, at times, they had to invent 'clinical connections' in their applications. In other words, some panel members thought that the SCM is changing its scope and becoming a council primarily for applied medical research.

The evaluators noted that the panel representatives, with one exception, came from non-clinical panels and were basic scientists. Hence, the opinions might not be representative. To obtain a more balanced view, additional panel chairs were interviewed by telephone. These interviews revealed that the above-mentioned critique was not shared by all panels.

Nevertheless, it seems urgent for the SCM to make clear in the future that it welcomes basic biomedical research. It should be kept in mind that many of the most important discoveries in medicine originated from basic research whose medical applications no one could foresee at the time.

To avoid misunderstanding, it was recommended that the naming of disease-oriented panels should be changed. Instead of naming them Disease mechanisms of the... (cardiovascular system, nervous system, etc.) the panels could be named The cardiovascular system and its diseases, The nervous system and its diseases, etc. to clarify that the panels also welcome applications for basic research in the field.

Panel members held the general opinion that the workload was very heavy, and they would welcome a reduction in the number of applications that each member had to process.

## Workload of the panels

In 2009, the number of applications per panel ranged from less than 40 to nearly 80 in the different panels. This variation reveals that the adjustment in panel numbers did not comply with the 2005 decision calling for a yearly adjustment to balance the workload among the panels. The evaluation committee (EC) holds the opinion that the Scientific Council for Medicine (SCM) should increase the number of panels, aiming at less than 50 applications per panel. The EC concluded that the workload in some panels was too heavy and recommended that alternatives should be explored to decrease the workload. Alternatives might include: increasing the number of panels, increasing the length of the granting period for applicants with exceptional track records, or increasing the number of panel members. A more drastic measure would be to allow for ongoing submission of applications, i.e. no application deadlines (NWO, ZonMw have several years of experience with this and found it reduces the number of applications). Also the National Institutes of Health (NIH) has experience with continuous submission and is gradually expanding towards a process without deadlines for applications.

## Triage process

The Swedish Research Council faces an increasing workload not only because of the load of applications, but also because of an ever-increasing workload on the staff of the Scientific Council for Medicine. Therefore, a triage process was introduced to sort out at an early stage those applications that stand no chance of being funded. The SRC appears to have several measures to ascertain that the process is 'safe'. However, there is always a risk that highly original applications, or applications from applicants lacking a strong publication record, could be rejected due to a lack of expertise on the panels. Looking at the funding profile, it appears that the probability of getting funded increases dramatically with the number of years that an applicant has held a PhD.

It is recommended that the SRC carefully oversee the triage process.

## Partiality

According to the new conflict-of-interest policy, a member of the Scientific Council for Medicine cannot be part of a panel during the year of their own project grant application. This is clearly a good policy that should be maintained. It does, however, not solve all problems related to partiality. Sweden is a small country where scientists in a particular field tend to know each other. Some of the comments received via the questionnaires were alarming. Too many of the comments implied that a scientific “brotherhood” exists where there is a tendency to “scratch each other’s backs”. Obviously, this problem is difficult to solve. However, the inclusion of panel members from the other Nordic countries is an important step in the right direction. Sending applications to external experts for written comments might be an additional measure. We also considered the idea that the SCM (i.e. administration in collaboration with panel chairs) could take the responsibility to direct applications to the respective review panels, and the applicant would not have a choice in the matter. In that case, there would be no need to communicate the identify of the members on the respective panels, which might prevent “back scratching”. The panels could be appointed from a pool of potential reviewers soon after the applications have been received.

Anonymous applications would appear to be a solution to the problem. Such a process would, however, be difficult to manage and makes it impossible to consider the applicant’s previous track record and performance.

## Gender issues

The panels appear to have a good gender balance. Still, the success rate of female applicants is significantly lower than that of males. This has not changed as a result of the panel reorganisation. If anything, there has been a slight shift in the wrong direction. However, it appears highly unlikely that this disparity reflects differences in quality between applications from male and female scientists. When it comes to approval rates for project grants, female applicants have been consistently less successful than their male counterparts. In 2008, the rate was 35% for males, but only 27% for females. This difference seems unreasonable. However, a striking feature is that the approval rate increases with the number of years that an applicant has held a PhD. Adjusting for this bias, the difference is negligible.

## Young applicants

The approval rate for new applications is low (as low as 12% for women in 2009). One would expect to find many of the applications from young investigators in this category. No data are available to show possible differences after the introduction of the new panel organisation.

During the first five years (family leave excluded) after receiving a PhD, scientists may apply for Junior Research Positions. These positions come with a project grant that runs for four years of the position and a starting grant the first year. In budgetary terms, approximately 35% of the SCM budget goes to scientists that have held a PhD for less than ten years.

Irrespective of the panel organisation, it is difficult for young investigators to compete with experienced scientists with strong publication records. It was suggested that special measures be taken to assure that promising young scientists have a fair chance to establish themselves. Setting aside an earmarked sum of money for this category would probably be the best solution.

## Missing subjects

A panel organisation that is based largely on disease categories runs a risk of being incomplete. The most striking omission appears to be cancer. According to the architects of the new panel organisation, the idea was to divide cancer applications according to the organ affected by the tumour studied. This makes sense, but involves a risk that applications dealing with similar subjects could be assigned to different panels, and thereby they would not be competing with each other. It is recommended that the Scientific Council for Medicine reconsider the idea of having a specific cancer panel, particularly for applications that deal with more basic scientific questions related to cancer. This is further justified by the fact that the number of cancer applications has increased dramatically due to a policy change. Other subjects that are conspicuously absent from the panel list are epidemiology, physiology, and pharmacology. Both physiology and pharmacology need to be promoted, as expressed in a letter to the SCM from the Royal Academy of Sciences. (Appendix X) Given the importance of the Swedish pharmaceutical industry, the absence of a dedicated review panel to handle applications in the field of drug design and development is remarkable.



## Lack of calibration

According to the current panel organisation, several parallel panels evaluate applications that deal with identical research subjects. There are, for instance, three panels that deal with disease mechanisms and two panels that evaluate applications in public health and nursing. It is the view of the EC that competition on identical terms is an essential component of a well-functioning review system if it is to have the full trust of the scientific community and the bodies and agencies providing funding for research. Hence, it is recommended that applications addressing very similar subjects compete against each other in the same panel. As suggested above (e.g. under “Partiality”) the SCM could decide which panel (and the members of the panel) will review which application.

A worrying observation was that the approval rates varied considerably among panels, ranging from < 20% to nearly 50%. There is no reason a priori to expect that the approval rate should be the same since the quality and relevance of the applications could vary in different panels. However, since the resources are distributed to the various panels before the applications have been reviewed there is a risk for underfinancing some research areas relative to others. It is recommended that this be kept in focus and under scrutiny in the forthcoming review process.

## Should applicants choose their review panels?

The current rules of the SCM give the applicants the opportunity to select their review panels. The interviewed evaluators/applicants expressed the view that this option is important. However, the EC feels that this is not necessarily true. Fairness in evaluations might be optimised if the SCM assigned the applications to the various review panels. This would allow the SCM to adjust its panels based on the applications that have been submitted. However, with this option the SCM would need to retain a pool of reviewers so as not to prolong the evaluation process. If the Council decides to maintain the option where the applicants choose an evaluation panel, the expertise of the different panels would need to be described in greater detail.

## Composition of review panels

Currently, the Scientific Council for Medicine has 17 review panels involving 115 persons (50 women and 65 men). The possibility for any scientist to nominate candidates for the panels appears to be appropriate. One complaint concerned the lack of full descriptions of the expertise available on each panel. Such descriptions would help applicants choose the optimal panel to review their application. This should be considered in light of the future decision regarding whether or not applicants may choose their review panel.

## Expertise of review panels

Although panel size appears to vary somewhat, a typical panel consists of six members, five of whom read the full application. For each application, one panel member is selected to be the main evaluator. The reorganisation resulted in a change in the competence profiles of the panels. To promote interdisciplinary research, there has been an ambition to include representatives of both basic and clinical research on each panel. Clearly, this is advantageous when it comes to evaluating translational research since both specialists and generalists serve on the panels reviewing each application (“generalist” being an experienced scientist but without expertise in the narrow field targeted by the application). Consequently, there is a risk that a panel’s expertise in specific areas becomes shallower, and that few members on a panel have the full competence to critically evaluate an application. A concern raised during the interviews was that the main evaluator occasionally has too much influence on the final decision.

What can be done to compensate for the relative lack of panel expertise? One possibility would be to send these applications for written review to experts outside of the panels, or abroad.

A surprising observation was that the SCM refrains from using bibliometry. Although many problems are associated with this technology, in unclear cases it could be helpful, e.g. in making decisions concerning scientists with long track records. However, care should be exercised when using bibliometry, taking into consideration the different stages in a scientist’s career (early, middle, versus late) and differences between disciplines.

# ORGANISATION OF EVALUATION PANELS IN OTHER COUNTRIES

The evaluation committee was informed about the organisation of peer review panels in ten countries in Europe and North America and concluded that evaluation panels could be organised in many ways. Some countries organise the panels around specific subjects (like the SRC). Others cover the whole domain of (bio)medical and (public) health research (Netherlands, Denmark), or divide panels into (a) biomedicine and (b) clinical medicine and public health (Norway, Switzerland, France). Most funding organisations engage external reviewers who provide written evaluations, although the extent of this practice varies widely. The UK, Netherlands, Switzerland, Spain, and France use external reviewers for each application, while the other countries use external reviewers only if expertise on their own panel or board is insufficient. Some countries give applicants an opportunity for rebuttal to the external review reports (UK, Netherlands). The number of panel members and the number of applications to be evaluated per panel varies widely (from 6 to 40 members per panel and from 35 to 300 applications per panel).

Some funding bodies have application deadlines once or twice a year. The Netherlands practices ongoing submission of applications for one of its instruments<sup>2</sup>. Introduction of ongoing submission of applications resulted in fewer applications and thereby a higher approval rate. The Centre for Scientific Research in the USA also uses continuous submission.

Based on this information it is difficult to argue for a single, common, best practise. Rather, the practical aspects of the review process have adopted different forms in different countries, but always keeping the central issue of the process, i.e. peer review, at the centre. The need to monitor one's own review process and to share, learn, and adopt good practices from other research councils is necessary to maintain a high standard in the review process, and this should be communicated clearly from the SCM.

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<sup>2</sup> Top grant: bottom up scheme for innovative lines of research to be performed by research groups with an outstanding track record.

# DISCUSSION

The new panel organisation has been in use for only three years, encompassing three cycles of application reviews. This is too short a time to draw any firm conclusions about the long-range effects that the revision will have, or has had. Another point to consider is that a decision has been made to replace the Scientific Council for Medicine in the near future with a Council of Health. Hence, it would be unwise to make any drastic changes in the panel organisation at this moment. Furthermore, the results of the evaluation do not call for any major changes. To have a better idea whether the reorganisation changed the type of applications, or type of research approved, the SCM might consider monitoring what types of applications<sup>3</sup> are received (basic, translational, clinical, applied research) and which are approved.

How should an ideal panel organisation be designed to allow for optimum review of research applications? First, the review panels should include sufficient expertise to ascertain that each application receives a professional and fair evaluation. In practice, this means that at least two members on a panel should be competent enough to pass expert judgment on the application. When a panel lacks sufficient expertise, it is proposed that external review reports be requested. A problem that needs to be addressed in this context is the calibration of assessments. Second, extensive measures should be taken to avoid partiality, which is extremely difficult to achieve in a small country where established scientists tend to be a part of networks that span the entire nation. It appears that the steps taken go very far, and the evaluators would like to commend the SRC in this respect.

An additional requirement for a fair evaluation system is that comparable applications must be evaluated in a manner where they compete against each other. The current panel organisation involving parallel panels, e.g. disease mechanisms and public health and care sciences, does not allow for this direct competition. Parallel panels offer an advantage when it comes to avoiding partiality, but the question remains whether or not it would be better to have panels that are sub-specialised.

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<sup>3</sup> It is suggested to look into the health research classification system developed by the UKCRC (<http://www.hrcsonline.net/>) and presented during the Sigtuna meeting in May 2009.

Furthermore, it seems important to implement the already approved decision calling for a dynamic panel organisation.

The broader composition of panels in the new organisation has certain advantages and disadvantages. In some cases, specific expertise may be lacking, which can be compensated for by external review reports. On the other hand, valuable input from the clinical perspective is introduced, e.g. in the evaluation of preclinical applications.

The concerns, raised by several panel members (most of whom represented basic science), regarding the support for basic medical research should be taken seriously. The sense that basic science applications are less welcome is probably largely psychological. The naming of the panels is, in this context, unfortunate. To avoid misunderstanding, it is proposed that some of the panel designations be modified, using the model; *The nervous system and its diseases* / *The cardiovascular system and its diseases*.

An important aspect of the evaluation would have been to analyze whether the panel reform has resulted in a transfer of funding from one research area to another, e.g. from basic research to clinical research. The sparse information available to the EC does not indicate that this is the case.

# SPECIFIC RECOMMENDATIONS

It is recommended that the basic structure of the organisation be maintained, but with some modifications. For instance, it should be clearly communicated that the Swedish Research Council welcomes, and in fact expects, grant applications for basic research. A strong argument for maintaining the organisation is that translational work is anticipated to increase in the near future. The EC does, however, recommend some adjustments related to decreasing the workload of the panels, the expertise of the panels, conflict of interest, and feedback to applicants.

## Workload:

- The panel reform has reduced the number of applications per panel member, but the range is too wide (from <40 to nearly 80). This range is surprising since one of the points of the panel reform was that the panel organisation should be flexible and reflect the application pressure.
- The number of panels or panel members per panel should increase to maintain a reasonable workload for the panel members.
- The decision that each panel member does not read all applications is a reasonable means to decrease the workload. In large panels it might be appropriate to allow additional persons to read only the abstracts.
- The triage process appears to work well and to be well accepted. It is an important measure to maintain the workload at an acceptable level.
- Other options are to conduct a pilot with continuous submission, which would spread out the work over a year and might reduce the number of applications. Perhaps this might be considered for the grants aimed at young researchers.

## Expertise and panel designation

- Panels lacking sufficient expertise to evaluate certain applications should be encouraged to send applications to external reviewers for written review.
- The already approved decision that panel organisation should be flexible and adapt to the application pressure should be implemented.
- Rather than having parallel panels (three for disease mechanisms and two for public health and nursing) it is suggested that the panels be given individual profiles to promote competition on equal terms.



- The SCM should consider whether to include new panels, e.g. a panel to handle cancer applications, and drug design and development.
- Given that the interviews revealed a feeling in the scientific community that the SCM primarily wishes to support applied medical research, it is essential to communicate that the SCM expects and welcomes applications for basic research. In some cases, panel designations should be changed to make it clear that the disease-oriented panels welcome basic research applications.
- The approval rates in different panels show unexpected variation (range <20% to nearly 50%). It is recommended that the SCM look into this since it may reflect differences in resource allocations to different subject areas.

### Partiality

- The decision to include scientists from the Nordic countries was wise and could be expanded, perhaps beyond the Nordic countries.
- The privilege for the applicants to recommend review panels might be reconsidered.
- The SCM might consider having a pool of reviewers/panel members and assemble the panels when the applications have arrived at the Council.
- It is recommended that the SMC earmark a specific sum of money for young investigators to give them a fair chance to compete for resources. The current evaluation system appears to put young applicants without a long track record at a disadvantage.

### Quality of feedback on decisions

- Feedback to the applicants needs to be improved. This is a critical component in an evaluation process and plays an important educational role, particularly for young investigators.

# SAMMANFATTNING

Syftet med utvärderingen är att göra en översyn av den nya beredningsorganisationen inom ämnesrådet för medicin (ÄRM), vilken infördes 2006. När beslutet till omorganisation av beredningsgrupperna togs, beslutade man samtidigt att den nya organisationen skulle utvärderas efter tre år. Huvudanledningarna till en förändring av beredningsorganisationen var: (1) att synliggöra nyttan av grundläggande medicinsk forskning för att förebygga, behandla och bota sjukdomar, (2) ett ökat söktryck, (3) en ny jävspolicy.

Utvärderingen genomfördes under perioden januari–augusti 2009 av en panel av externa experter utsedd av ämnesrådet. Slutsatserna och rekommendationerna är baserade på enkäter, intervjuer och information från Vetenskapsrådets databas.

Utredarna anser att den nya beredningsorganisationen har tydliga fördelar men också några nackdelar. Utredarna rekommenderar att ämnesrådet behåller grundstrukturen i den nya organisationen, men att vissa förändringar bör göras.

Utvärderingspanelen rekommenderar följande förändringar som relaterar till arbetsbörda, ämnesexpertis och beredningsgruppernas namn, hantering av jävsförhållanden samt kvalitet på feedback av beslut.

## Arbetsbörda

- Förändringen av beredningsorganisationen har minskat antalet ansökningar per ledamot i beredningsgrupperna, men variationen är alltför stor.
- Antalet beredningsgrupper eller antalet ledamöter per beredningsgrupp bör öka för att bibehålla en rimlig arbetsbörda för ledamöterna.
- Beslutet att varje beredningsgruppsledamot inte läser samtliga ansökningar är rimligt i syfte att minska arbetsbördan. I större beredningsgrupper kan det vara lämpligt att låta ytterligare personer läsa enbart sammanfattningarna.
- Triage-förfarandet verkar fungera väl och är accepterat, och bör därför behållas. En uppföljningsstudie bör dock göras.

## Expertis och namngivning av beredningsgrupperna

- Om beredningsgrupper saknar tillräcklig expertis för att bedöma vissa ansökningar bör de uppmanas att skicka ansökningarna till externa granskare för skriftlig bedömning.



- Det redan fattade beslutet att beredningsorganisationen ska vara flexibel och återspegla ansökningstrycket bör implementeras.
- Istället för parallella beredningsgrupper (3 för sjukdomsmekanismer och 2 för folkhälsa och vårdvetenskap) föreslås beredningsgrupperna ges individuella profiler i syfte att öka konkurrensen mellan ansökningar inom samma område.
- ÄRM bör överväga om några nya beredningsgrupper ska införas, till exempel en som hanterar canceransökningar.
- Med tanke på att intervjuerna visade på att det finns en risk att forskarsamhället uppfattar det som att ÄRM ger stöd till tillämpad medicinsk forskning är det av stor vikt att kommunicera att ansökningar med fokus på grundforskning förväntas. Några av beredningsgrupperna bör byta namn, så att det tydligt framgår att de sjukdomsorienterade beredningsgrupperna välkomnar grundforskningsansökningar.
- Beviljandegraden i olika beredningsgrupper visar på en oväntad stor variation (från <20% till nästan 50%). Panelen rekommenderar att ÄRM ser över detta då det kan tyda på olikheter i medelstillelning till olika ämnesområden.

## Partiskhet

- Beslutet att inkludera forskare från andra nordiska länder var klokt och kan kanske utökas ytterligare även utanför Norden.
- Förmånen att som sökande rekommendera beredningsledamöter bör eventuellt omprövas.
- ÄRM bör överväga att ha en pool av bedömare och samla beredningsgrupperna först när ansökningarna har inkommit till ämnesrådet.
- ÄRM rekommenderas att öronmärka en särskild summa pengar till yngre forskare för att ge dem en möjlig chans att konkurrera om forskningsmedlen, då det verkar som om yngre sökande utan lång meritlista missgynnas i det existerande bedömningsystemet.

## Kvalitet på feedback av beslut

- De sökandes feedback måste förbättras. Det är en väldigt viktig komponent i bedömningsprocessen och har en viktig utbildande roll särskilt för yngre forskare. Det bidrar även till transparens i bedömningsprocessen.

# APPENDIX 1: RESULTS FROM SURVEY ABOUT VR-REVIEW 2007

Did you participate in an Evaluation Panel at the Swedish Research Council Medicine in 2005 or earlier, i.e. before the reorganisation of Evaluation Panels?

Response options	Number of responses	Distribution (%)
Yes	12	22.2
No	42	77.8
Total:	54	100.0

Has your workload changed due to the reorganisation of the grant review process?

Response options	Number of responses	Distribution (%)
Increased a lot	1	2.0
Increased a little	2	4.0
Unchanged	4	8.0
Decreased a little	3	6.0
Decreased a lot	3	6.0
I did not participate in an Evaluation Panel before the reorganisation	37	74.0
Total:	50	100.0

How well do you think the new grant review process is working out in terms of categorising the applications?

Response options	Number of responses	Distribution (%)
Very well	7	13.5
	32	61.5
	7	13.5
	6	11.5
Very badly	0	0.0
Total:	52	100.0

# APPENDIX 2: RESULTS FROM SURVEY ABOUT VR-REVIEW 2008

Did you participate in an evaluation panel at the Swedish Research Council Medicine in 2005 or earlier, i.e. before the reorganisation of the grant review process?

Response options	Number of responses	Distribution (%)
Yes	20	29.0
No	49	71.0
Total:	69	100.0

Has your workload changed as a result of the reorganisation of the peer-review process?

Response options	Number of responses	Distribution (%)
Increased a lot	1	3.4
	3	10.3
Unchanged	13	44.8
	5	17.2
Decreased a lot	3	10.3
I did not participate in an evaluation panel before the reorganisation	0	0.0
No opinion	4	13.8
Total:	29	100.0

How well do you think the new grant review process is working out in terms of categorising the applications?

Response options	Number of responses	Distribution (%)
Very well	16	23.5
	28	41.2
Neither well nor badly	12	17.6
	3	4.4
Very badly	1	1.5
No opinion	8	11.8
Total:	68	100.0

This year (2008), a "triage" process was tested. Only applications with a reasonable chance to be considered for funding were discussed further at the evaluation panel meeting. Did this change your workload?

Response options	Number of responses	Distribution (%)
Increased a lot	2	2.9
	4	5.9
Unchanged	20	29.4
	26	38.2
Decreased a lot	4	5.9
No opinion	12	17.6
Total:	68	100.0

## What is your overall opinion of the triage procedure?

Response options	Number of responses	Distribution (%)
Very good	32	47.1
	17	25.0
Neither good nor bad	6	8.8
	2	2.9
Very bad	3	4.4
No opinion	8	11.8
Total:	68	100.0

## What is your overall opinion of this year's peer-review process?

Response options	Number of responses	Distribution (%)
Very good	86	35.0
	125	50.8
Neither good nor bad	32	13.0
	3	1.2
Very poor	0	0.0
No opinion	0	0.0
Total:	246	100.0

The Scientific Council for Medicine within the Swedish Research Council reviews, evaluates, and prioritises applications through peer review by the research community. A new review organisation for grant evaluation was established in 2005. In the new organisation the evaluation panels were grouped, to the extent possible, according to diagnostic areas, spanning from molecular investigations to cohort studies.

This evaluation, performed by an external committee, aims to address the effect of the new panel organisation on the applicants, the reviewers, the Scientific Council for Medicine, and the administrative personnel at the Swedish Research Council. The results show clear advantages for the revised panel organisation, but the evaluation also presents recommendations for further development.



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The Swedish Research Council is a government agency that provides funding for basic research of the highest scientific quality in all disciplinary domains. Besides research funding, the agency works with strategy, analysis, and research communication. The objective is for Sweden to be a leading research nation.

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