

Forte Centres of Excellence

Final Evaluation

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1. Centres of Excellence as a form of research funding

Centres of Excellence in Sweden and beyond¹

Across Europe, a number of governments have implemented a series of excellence initiatives geared towards the establishment of “world class” research environments at selected university locations. For instance, in 2005, the German Federal and State governments jointly launched a high-profile platform centred on three key elements: a) Graduate schools; b) Clusters of Excellence; and c) Institutional Strategies. Between 2006 and 2011, a total of Euro 1.9 Billion was allocated to this. In 2012, a new 5-year scheme - worth Euro 2.4 Billion and targeting the creation of 45 graduate schools, 43 clusters of excellence and 11 institutional strategies to promote top-level research at 39 universities – was launched. The scheme was controversial not only because it challenged a national tradition of egalitarianism, but also because it re-enforced the differences between weaker (“have not”) and stronger (“haves”) research environments across the country (Kehm and Pasternack 2009). A recent assessment by the OECD (2014) identified government-driven Research Excellence Initiatives (REIs) as a prevalent feature of the European higher education policy landscape in the last decade.

At the Nordic level, the Nordic Council of Ministers (NCM) has devised an excellence programme targeting high level research communities throughout the five Nordic countries – Norway, Sweden, Finland, Denmark and Iceland. According to the NCM, a “Nordic Centre of Excellence [NCE] is an outstanding, creative and efficient multi-site or single-site environment with a joint research agenda, joint management, coordinated researcher training, common communication activities, and collaboration on research infrastructure.” (NCM 2013: 1). The programme’s main aim is to increase and facilitate cooperation between excellent researchers, researcher groups or institutions in the Nordic countries. NCEs are funded (for a five-year period) under thematic programmes, prioritised by the Nordic countries. Funding decisions are based on calls, with an open competition and in-depth peer review performed by external and international experts.

The excellence idea in Swedish research policy can be traced back to a government bill from the turn of the millennium (Swedish Government 2000). Strong research environments were to be established through funding from the then newly created National Research Council (Vetenskapsrådet). The policy logic is summarized in the following sentence: ‘In order to sustain the position as a leading research nation a mobilization is needed in Swedish research’ (Swedish Government 2000, p. 12; own translation). From its foundation, the Research Council has funded ‘basic research of highest quality,’ initially primarily by funding individuals or small teams of researchers.

Critical input to the policy process concerning Centres of Excellence (CoE) was provided in a 2004 white paper, ‘Funding of strong research environments – an international outlook’ (Andersson 2004). Based on an overview of international initiatives (benchmarking), the idea of a ‘triple ten rule’ was launched: 10 percent of the total national research expenditure, 10 million SEK yearly support over 10 years. Most of the CoE schemes launched by the funding bodies followed this recipe, albeit with slight variations. In Sweden, the government played a crucial role in the translation and policy formulation of the excellence agenda. The implementation of CoE schemes was largely delegated to the funding bodies, that is, the research councils and the innovation agency Vinnova. There was strong support for the idea of allocating money to excellent research groups rather than distributing it equally to all researchers. Implementing a research bill

¹ This text builds upon Geschwind, L. and Pinheiro, R. 2017. Raising the summit or flattening the agora? The Elitist Turn in Science Policy in Northern Europe. *Journal of Baltic Studies*. Published online: 13 Apr 2017.

(Swedish Government 2005), a number of excellence schemes were established from 2005 onwards, each with a particular strategic focus: The Forte Centres (scientific excellence and social challenges/strategic objectives); the Berzelii Centres (scientific excellence and economic rationales/innovation); and the Strategic Research Centres (social challenges/strategic objectives and economic rationales/innovation). The latter were funded by a private foundation.

The total number of Centres of Excellence funded by the schemes now amounts to 88, of which 21 are hosted by Lund University. In a 2008 bill (Swedish Government 2008), further concentration of resources and prioritization was on the agenda. In line with the previous bills, the government criticized earlier allocation models, which were based on historical criteria (head counts) instead of excellence. Rather than allocating direct state funding in the form of block grants, the government now wanted more distinct institutional profiles. The policy solution was called Strategic Research Areas (SRAs) and encompassed targeted long-term funding for designated areas. The government used three criteria in prioritizing the SRAs that would be funded in these SRAs:

- Research that, in the long term, has the prerequisites to be of the highest international quality;
- Research that can contribute toward fulfilling major needs and solving important problems in society;
- Research in areas that has a connection with the Swedish business sector.

The Swedish Research Council (Vetenskapsrådet), the Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), the Swedish Energy Agency (Energimyndigheten), and the Governmental Agency for Innovation Systems (VINNOVA) were commissioned to organize the application process and to review and recommend the allocation of funds to Swedish universities in these SRAs. Finally, the most recent Research and Innovation Bill emphasizes the quality agenda, stressing the role of direct state funding as a precondition for breakthrough research (Swedish Government 2012).

To sum up, the Swedish Government's investment in Centres of Excellence was a response to an international trend to promote highest possible research quality. In the Swedish case, this also represented a research policy shift, away from sector expansion to concentration of resources at the very best research environments. By implementing larger research environments higher quality, more visibility and interdisciplinary encounters were expected to be created.

Forte Centres of Excellence

In the Research Bill *Research for a better life* (2004/05:80) the Swedish Government introduced the concept of Strong Research Environments. The aim was to give the most successful researchers possibilities to conduct long time research in attractive research environments to increase international visibility and competitiveness of Swedish research. Such environments were perceived as being of central importance in making Sweden a strong research nation. In the Bill strong research environments were defined as:

- High class research both with regard to quality and quantity
- Well-developed collaboration with other national and international research environments
- High national and international visibility and appeal
- Combination of innovative power and solid base in related research areas

- Often combines different lines of research or disciplines which are cross-fertilizing
- Often contains an influential researcher as source of inspiration or as coordinator
- Researchers have high and common objectives for the research

The Government invested 300 million SEK in Centres of Excellence. The research councils and the Swedish Innovation Agency (Vinnova) were commissioned to organize the application process and was given extra funding for this:

- Formas: 20 million SEK
- Forte: 10 million SEK
- Vetenskapsrådet: 210 million SEK
- Vinnova: 60 million SEK

Forte got additional funding for research on elderly, and with this funding together with funding for strong research environments, as well as funding from Forte's regular budget, made the total budget for the Centre of Excellence call to 533 million SEK for ten years.

In 2006 Forte announced a call for Centre of Excellence. In the call Forte added two more criteria:

- Research within the core parts of Fortes' area of responsibility
- A strategy for the communication of research results

The applications were submitted by Swedish universities or university colleges and not by individual researchers or research groups. It was stated in the call that the universities of Stockholm, Gothenburg, Lund and Karolinska Institute could submit three applications each, the universities of Umeå, Linköping and Uppsala could submit two applications and the remaining HEI's could submit one application. It was also stated that centres which had received Linnaeus or Berzelius grants were not eligible for Forte centre grants. These were the centres of excellence funded by Formas, Vinnova and VR.

In the call, an important prerequisite for getting a Forte centre grant was the contribution by the applying university/university college to the funding of the centre. The centre should be a part of the strategic planning of the university, which should contribute at least 50 percent of the amount applied for over the entire time-period. The co-financing could consist of support in the form of space, working time of researchers and other staff as well as economic contributions to research or infrastructure. It was also said in the call that the applying university/university college was expected to take over the responsibility for future funding of the centre, at the termination of the Forte funding period.

Out of twenty-nine applications ten centres were granted. They covered core parts of Fortes' area of responsibility such as: alcohol, elderly, inequality, international migration and ethnic relations (IMER), public health and work environment. Four of the centres were already funded by Forte since 2001. These centres were taken over by Forte when it was established in 2001, from Socialvetenskapliga forskningsrådet, a predecessor to Forte.

In 2007 Forte announced a call for Research Schools. They were aimed at the centres and since the centres had already been granted it was decided that there was no need for a peer-review assessment of the applications. Budget and organization of the schools was assessed inhouse and all seven applications for research schools were granted, of which six were connected to the centres. In 2012 there was another call for Research Schools aimed at the centres (see Appendix for a list of the centres and their research schools).

Evaluation of the Forte Centres of Excellence

According to the Research Bill the centres should have regular follow-ups, and during the ten-year period evaluations after certain intervals. The research councils were free to decide when to do these evaluations. In a joint decision between the research councils it was decided that evaluations should be conducted after two years, five years and after the funding period ended. It was also agreed upon what these evaluations should focus on.

After two years the focus was on recruitment, organization and leadership of the centres, as well as the commitment by the HEI to co-finance the centre. The second evaluation (mid-term evaluation) focused mainly on the scientific output from the centre and the added value. The final evaluation, after the funding period had ended, the Government said should focus on the effects of the grant on the research funding system.

The first evaluation showed that the Forte centres had recruited relevant personnel, and that organization and leadership was in place. The second evaluation (mid-term evaluation) showed that most centres had high quality scientific output.

After the mid-term evaluation the board of Forte decided to shut down one of the centres, due to problems with organization and leadership. At the organizational level, several obstacles were obvious, most importantly limitations of common infrastructure and research facilities, work in distant buildings, and lack of a joint 'vision' and related strategy represented by the steering committee. Another centre got its grant reduced by 20 percent while another centre got an increase of the grant by 20 percent.

2. Evaluation method

For the final evaluation the same evaluation panel who did the mid-term evaluation was asked to conduct the evaluation. Out of the previous six members of the panel four were recruited, with three more members added on making a panel of seven evaluators. The purpose of having the same evaluation panel was to get a longitudinal perspective on the development of the centres. Since the main focus of the evaluation is on the grant as such and its effects, a Swedish researcher on research policy was added to the evaluation panel.

A questionnaire in two parts were developed, where one part was directed to the Vice-chancellor of the Higher Education Institution (HEI) where the Centre of Excellence is located, and one part was directed to the senior researcher of each Centre. The panel was then provided with the following information:

- A self-assessment by each Centre of Excellence about their research, publications, general programme of work as well as reflections on the added value of the Centre of Excellence grant.
- A self-assessment by each Vice-chancellor about the relevant Centres, their integration into the university profile, what happens with them after the grant period and reflections on the added value of Centre of Excellence grant.
- Background information about the work of each Centre, including copies of the original applications, the previous assessments of the Centres and related materials.

In addition, the Review Panel held hearings from 10th to 12th of September 2018. This provided opportunity to explore key questions with the Vice-chancellor of each HEI that hosted a Centre, and with key researchers from each of the Centres.

3. Forte Centres of Excellence

Introduction

The Forte Centres of Excellence has conducted research within core parts of Fortes' area of responsibility, such as aging, alcohol, inequality, international migration and ethnic relations, public health, and work environment. Over the ten-year grant period, 2007-2016, the centres have received in total 533 million SEK from Forte. The co-funding from the universities have been nearly the same, 525 million SEK.

The centres have also received external funding from Forte, in the form of three-year project grants and six-year program grants. They have also received external grants from The Swedish Research Council (VR), The Swedish Research Council for Environment, Agricultural Sciences and Spatial Planning (Formas), Sweden's innovation agency (Vinnova) and The European Research Council (ERC), amounting to nearly 1 billion SEK.

The centres show a remarkable resilience over time. As a basic requirement, they were, or indeed had the potential to become, excellent already at the time of the funding decision. However, most centres have continuously throughout the ten-year period produced research and researchers of high quality. Together with other external funding sources the total amount of funding of the centres is nearly 2,9 billion SEK. The Forte funding then amounts to 19 percent of the total funding. Together with the co-funding from the universities it amounts to 37 percent of the total funding. This means that the centres have been very successful in attracting external funding which in turn has made them less vulnerable and at the same time more attractive for additional investments, e.g. from the host HEI.

Over 600 persons have been involved in the Centre's activities, including lecturers, professors, docents, technicians and administrative personnel, of which 62 percent are women. Nearly 17 percent of the personnel are professors of which 59 percent are men, and nearly 17 percent of the personnel are docents of which 61 percent are women. There is a significant variety regarding the organization and leadership of the centres which reflects both the institutional environments and disciplinary traditions. There are many ways to be a Centre of Excellence.

Six of the centres were granted research schools by Forte, with a total number of 557 PhD students. The total number of PhD students attached to the centres, either by participating in research schools and doctoral courses are 657. The total number of doctoral exams during the period is 228, of which 144 were women.

The number of scientific peer-reviewed publications in refereed journals during the time-period is over 6 500, many of them published in high ranking journals. Peer-reviewed conference publications, books and book chapters comprise almost 1 400 and other types of publications, such as reports, and popular scientific publications, reach almost 1 000. The data from the self-evaluation reports shows different publication traditions for different centres. Centres with many scientific peer-reviewed publications in refereed journals tends to publish less books and book chapters in edited volumes, while other centres focus more on publications in books and edited volumes.

Karolinska Institute

Ageing Research Centre (ARC)

ARC is a collaboration between Karolinska Institutet and Stockholm University. The Centre received two tranches of Forte funding (2000-2006; 2007-2016) and has continuing financial commitment from KI and Stockholm University. Between 2008 and 2015 it received Forte funding for a Graduate School in Health and Ageing. ARC is organized around three main themes: Geriatric Epidemiology, Neuropsychology and Socio-gerontology, each with a lead and senior researchers, research scientists, post docs and PhD students. Ageing research fits with the KI overall strategy, endorsed by the Vice-Chancellor during the hearing.

Scientific quality and quantity

ARC is a successful Centre with many indicators of research strength. They have regularly and consistently published articles in top international peer reviewed journals and have significantly contributed to the disciplines of geriatric medicine, public health, sociology and gerontology reflecting an interdisciplinary approach to ageing and dementia research. Eleven percent of their publications are in the top 5 percent of international journals. The team identify 7 key findings which have made a difference to the knowledge of ageing and dementia and have social and clinical impact with their focus on brain ageing, prevention of dementia and inequalities in ageing; their contribution to the field is reflected in the volume of citations and numerous invitations to participate in research bids and present their research work across the world together with an impressive list of awards and honors presented to researchers at all levels in the Centre. The Centre's access to a rich resource of longitudinal data bases, detailed in their self-evaluation report, has attracted fruitful partnerships and prestigious external funding. ARC is exemplary in both scientific quality and quantity.

Research environment

ARC is a physical entity, co-located with Äldre Centrum and the Swedish Dementia Centre giving the Centre proximity to key partners and impact generating activities. The cross fertilization of ideas and dissemination to the public is facilitated by this.

External funding is considerable and from prestigious funders both in Sweden and internationally (of note is their success with ERCs and JPIs as well as the EIT-Health programme). Their total income over the period of Forte core support increased from just under 30m SEK to over 70m SEK. They have been successful in securing two Forte programme grants since core funding ceased as well as from the EU in a series of projects and the quality and strength of the Centre has been supported by KI with 3 million SEK. The success of ARC has been reflected by the level of university funding levered in because of successful external grant capture.

Strategic collaborations in research and teaching extend from within and between the universities to across Sweden (SNAC-K and NEAR), consequently building capacity within Sweden in ageing and dementia research. This extends to a European and global focus on project collaborations. The Centre has engaged in continual inward and outward mobility enriching the research environment.

The Centre has matured over the period of Forte funding into a vibrant environment in which young researchers are trained. The Centre provides a good academic as well as social environment particularly inclusive of their young researchers and PhD students. A supportive career development is reflected in that ARC has a network for early career researchers called Junior ARC and some of their PhD students have gone on to positions at ARC.

The Centre has been successful in consciously developing a gender balance achieving gender neutral positions across all main positions (in governance e.g. the ARC board to recruitment e.g. PhD students).

Research School

During the period of the grant ARC successfully saw the completion of 39 dissertations. Since 2014 ARC is a collaborator in the Swedish National Graduate School for Competitive Science on Ageing and Health with CASE at Lund University, another Forte Centre of Excellence.

Teaching collaboration within the university and cross disciplinary areas is evidenced throughout the report; the Centre leads and contributes to a variety of research based educational activities and courses (first, second and third cycle). The cross fertilization of ideas between Swedish and international students is facilitated through the Graduate School which attracts more international students than Swedish graduates. ARC is significantly contributing to the next generation of researchers in ageing and health some of whom are now well recognized internationally.

Internationalization/International visibility

International networks and collaborations with other world-leading centres of ageing include some innovative features such as their 57 international forums and running advanced methods for ageing researchers. The work of ARC is made visible globally through several mechanisms and particularly international co-authorship. Mobility of staff and students occurs inwardly and out with the Centre building on their reputation as a high-quality research Centre with excellent data sets; the Centre is also a location for visiting dignitaries to KI. International strategic collaborations with the Mayo Clinic, Tokyo, Australia, Canada, Singapore and Chinese universities is supported by the university. Within Sweden new relationships are being developed with Linköping University and Dalarna University College.

Social impact

The ARC has strategically ensured societal impact through its numerous knowledge exchange activities engaging the key stakeholder groups including older people, research participants, policy makers and practitioners. They have extensive outreach activities, regularly produce media briefings and public engagement events. Collaboration with policy makers in various ministries and practitioners was less detailed although the hearing identified some connections in these areas.

Alongside increasing academic publications, the Centre has disseminated its work in accessible formats and engaged in public discussion around their major findings. They strive to make their work easily accessible.

Strategic planning for the future

Although staff at the Centre voiced their uncertainty the Centre has won considerable funding to take forward its main areas of strength.

The strategy adopted from the start of the core funding was to invest in senior staff and this has been successful in that they have won funding and consequently grown the Centre. This continues to be fruitful with the Centre being successful in winning Forte funding in the latest programme round.

Such success is recognized by the KI Vice-Chancellor with the investment of both Stockholm University and KI in contributing to funding the continuation of the Centre. The Centre is well placed given the intended focus of the new university strategic plan toward greater collaboration and internationalization.

Capacity for the future – the Centre has not been able to retain all its staff since the core funding stopped and consequently has had to review its scale. However, it has secured a variety of new projects such as NEAR, COBRA and the SIA project demonstrating its vitality and ability to continue to attract funding.

The team recognize the need to widen their focus from brain ageing to areas around environments, complementing the existing work and strengthening a more ecological framework.

Sustainability of the Centre

Since its inception, the Centre has had exceptionally strong leadership through Laura Fratiglioni. The Centre now has an opportunity for a new stamp of leadership under Johan Fritzell. ARC's plan is to increase their impact scientifically, clinically and socially and are in an excellent position to do this. They also have the leadership and supervision to ensure stability but question the economic base of the Centre going forward. It is important that the perception and reputation of the Centre as world leading is not jeopardized in a period of economic uncertainty.

Summary Evaluation and Recommendations

ARC is an exemplar of a successful research centre with vision, mission, strategy and in-built sustainability. It is highly regarded within Sweden and internationally by the gerontological community and has a rich resource of data sets and well-trained researchers to take the Centre forward ensuring a healthy future. It is critical however for reputation and sustainability that they can keep the momentum and cutting-edge nature to their work. It is vital to acknowledge the importance of core funding to support administrative staff who have contributed to this. Maintaining the gender balance may also be an issue.

In going forward ARC should consolidate what they do well and bring in new areas to support the core research rather than start new areas for their own sake. Opportunities could be increased to work with business and industry as well as the municipalities; such opportunities were recognized by the Vice-Chancellor as well as the ARC team during the hearing. Implementation of their research is an area for future consideration, particularly around guidelines for dementia and for the correct use of drugs in practice.

Linköping University

Institute for Research on Migration, Ethnicity and Society – REMESO

REMESO is a research institute focused on questions about migration, ethnicity and society. It has received funding from Forte from 2007 to 2016 under the Centres of Excellence programme and it has also received funding from Forte for the Graduate School. It has also been able to secure institutional support from Linköping University and external research funding from within Sweden and European sources. It is well networked with similar groupings of researchers on migration and ethnicity across Europe.

Scientific quality and quantity

REMESO has become a leading centre for research on migration and ethnicity, with a growing reputation for the quality of its research both in the Nordic context, and more broadly in Europe and internationally. It has focused on research in three broad areas: Migration, integration and ethnic discrimination; EU migration and governance; Citizenship, ethnicity and racialization. It has also developed research on global migration processes and on historical and cultural consequences of colonialism. There is strong evidence that REMESO produces research that is of high quality in the fields of migration and ethnicity. It has developed a reputation for the ways it utilises an interdisciplinary approach to research. It has a strong record of publishing in both international and Nordic journals, and there is also a strong record of publishing research monographs and prestigious edited collections.

Research environment

REMESO has been well supported by the university and housed in a building that allows the researchers and research students to work together and develop collaboration. The support of the university and Forte has allowed REMESO to develop a good research infrastructure for staff and it welcomes international visitors on a regular basis in order to take part in seminars and lectures.

Research school

The Research School has been a success over the period from 2007 to 2016 and there is a clear commitment by the university to continue its work beyond 2018. There is strong evidence that both Swedish and international students have successfully completed their doctoral studies at REMESO, and there is also a strong programme of teaching at master's level.

Internationalization/International visibility

REMESO has been successful in raising the international profile of Swedish research on migration and ethnic relations. The work of REMESO staff has been disseminated in many of the top international journals in the fields of migration and ethnicity and there is strong evidence that they have been invited to give plenary sessions at international conferences, research seminars and workshops. Much of the work of REMESO brings in collaborations with scholars who work in other national environments and this has also helped to further enhance the international profile of its work.

Societal impact

REMESO is active in seeking to explore the social impact of its research. Researchers have been active in discussing issues about migration, discrimination and integration in both the media and in policy circles. The university expressed the view that it sees REMESO as playing a key role in the university's commitment to address issues that are of social importance in the contemporary conjuncture.

Strategic planning for the future

The University and REMESO have been actively discussing ways to develop a strategic plan for the future. The commitment to a vision for REMESO post-2018 is outlined in the submitted documentation. In the discussion with both the university and the researchers there was a clear commitment to develop a vision for carrying the work of REMESO forward through efforts to link teaching with research and to attract external sources of research funding.

Sustainability of the centre

After the end of core funding from Forte there was some concern about the future of REMESO. But the University and the REMESO researchers have emphasized that there is a strong commitment by all sides to see the Institute remain a key centre for research post-2018. The plan is to seek further sources of external research funding from within Sweden and Europe more generally. It is also planned that the sustainability of the Institute will be strengthened by developing teaching at undergraduate, MA and PhD levels. REMESO has appointed two senior visiting professors to help address issues of gender balance. They have also advertised a position for a Professor to help sustain the research profile in the future.

Summary evaluation and recommendations

Overall the investment by Forte in REMESO can be considered a success. The funding was used to enable REMESO to further develop the quality and international profile of its interdisciplinary approach to migration, race and ethnicity research. In order to sustain this reputation REMESO will need to gain new sources of research funding and maintain the international networks it has been able to develop over the period it received Forte funding.

Lund University

Centre for Medicine and Technology for Work Life and Society – Metalund

Scientific quality and quantity

Metalund is a research Centre supported by the three Faculties of Engineering, Medicine, and Social Sciences (Work and Organizational Psychology) at Lund University. Core structural elements are the units of Occupational and Environmental Medicine (OEM) and the Ergonomic and aerosol technology (EAT). The latter also serves as formal coordination centre. Core aims are the production of innovative science with strong transdisciplinary components as well as practical applications, and the production of synergy between research and training/ teaching/ recruitment of young researchers. The collaboration developed between researchers in occupational medicine and in engineering are considered a unique achievement, not only nationally, and this would probably not have been achieved without the Forte Centre of Excellence grant.

As the scientific work of the first funding period was reported in the mid-term evaluation, the current report focuses on research from 2012 to 2017. Main achievements within 9 areas are highlighted in the report. Research with relevance to occupational health includes studies on musculoskeletal disorders (MSD) (measurement of physical workload, standardized assessment of MSD, exposure-response relationship, evaluation of technical and organizational interventions, hand-arm vibration), airways and cardiovascular diseases (CVD) (assessment of aerosol particles, provocation tests, exposure measurement, association of traffic exposure with respiratory disease and CVD), nephrotoxicity, neurotoxicity and diabetes (impact of heavy metals and air pollution/traffic density; prospective association of lead exposure with school performance, air pollution and pregnancy complications), cancer (occupational risks of DNA damage), and stress-related health problems (toolbox, stress provocation in virtual reality, stress and cognitive impairment, return to work after exhaustion). Additional research deals with risk assessment and exposure modelling (occupational chemicals; sample selection analysis) and risk management (vibration, safety and health; safety culture). Finally, two research areas deal with heat stress due to climate change (estimation of metabolic rate in heat, assessment of thermal load including international standardization) and with sustainable work among older people (social gradient of early exit from labor market, conditions of extending working life). While this range of topics is highly remarkable Metalund may nevertheless need to prioritize its efforts to maintain and improve scientific excellence.

The scientific output of Metalund's second term is very impressive, at least in quantitative terms. Given the many innovative findings, one would have expected some more original papers in journals with highest impact. Clearly, in view of the different disciplines, methodologies, study designs, and publication policies, it is difficult to give an overall assessment. In some areas, cutting-edge scientific developments were achieved, such as in studies linking epidemiological cohort data with molecular biological markers obtained from biobank data, including aerosol sciences.

Research environment

The research environment of Lund University is most favorable to the Centre. There has been impressive support from the University's leadership. New permanent professorships were allocated to the Centre, and considerable investments in laboratory infrastructure

were made. Moreover, the collaboration and coordination between the three Faculties has been strengthened. Metalund has a sound organizational structure, with distinct responsibilities for project coordination/management and for the research school. Project groups have enough autonomy and flexibility, and a distinguished stakeholder committee ensures the transfer of scientific results into practice and policy. Special efforts are visible to develop and maintain gender equity in leading positions across the Centre, including special training courses and the establishment of Lisa Meitner guest professorships. Although the self-evaluation report describes some strategies of recruiting talented graduate students from abroad, more information on recruitment of young scientists and their career development would have been helpful, specifically as the number of senior scientists is somewhat small and needs extension.

Research School

The Research School has been developed to an impressive degree (36 accomplished PhDs), continued graduate courses, seminars and network meetings, international courses (esp. on particles and health) as well as establishment of a new PhD program on particles and health (starting in 2018). The aims and contents of the five courses described in the self-evaluation report demonstrate a competitive, up-to-date program with international attraction. There are also several Master of Science programs, including 'Work and Organizational Psychology'. However, there is some concern that with the end of the Forte grant these promising programs may suffer to some extent, given a lack of resources for operating the full infrastructure.

Internationalization and strategic planning

The self-evaluation report's description of internationalization was rather scarce. However, the hearing on September 11 in Stockholm provided important additional information, documenting a series of international collaborations with distinguished research institutes within and beyond Europe. It also became clear that many researchers are very active in contributing to international conferences and meetings.

Strategic planning started in time within and beyond the Centre. Importantly, new funding opportunities were achieved, in particular the NanoLund Consortium, the EpiHealth initiative and the project MERGE. With a focus on climate change and susceptible development, topics of high interest to science and policy have been advanced and are being integrated into the University's strategic plan for the near future. The University is providing substantial cash transfer to bridge the transition from Forte funding to new funding opportunities, and all three Faculties are committed to support further developments. It is impressive to see that the amount of external funding in 2017 was twice as high as in 2007.

Social impact

A successful dissemination strategy of scientific information to the wider public has been established, with support from central services of Lund University. Establishing a high-level stakeholder group with distinguished representatives from economy and politics must be considered a unique feature and achievement of this Centre. This solid and successful exchange has already resulted in several far-reaching implementations of findings into engineering, application of assessment tools, manuals and software devices. In addition, some 'spin-offs' were founded and patents were achieved. Moreover, an ongoing transfer of knowledge to target groups is ensured, where a regular exchange with networks from Swedish enterprises and trade unions strengthens the Centre's societal impact.

The Centre's appraisal of the Forte grant

The self-evaluation report listed a number of strong arguments in favor of the funding format of Forte Centre of Excellence grant: a stable long-term funding; the recognition of an eminent research profile within the University as well as nationally and internationally; an important prerequisite of developing trans-disciplinary scientific collaboration; an opportunity of testing new ideas and approaches; the best way of recruiting and training a new generation of young researchers in the spirit of trans-disciplinary collaboration (through the Research School); and the ensuring of continued collaboration with external partners. These advantages by far outweigh the considerable costs (in terms of time and administration) of managing a Centre of Excellence.

Summary evaluation and recommendations

The highly productive and innovative trans-disciplinary research development between three Faculties of Lund University would not have been possible without the Forte Centre of Excellence grant. The impressive scientific achievements resulting from this cooperation are a convincing sign of success of this funding format. Since the midterm evaluation, the centre has received strong support from the University and was able to develop new research initiatives (e.g. NanoLund, EpiHealth, heat and climate change). Continuity and further growth of the centre are therefore highly likely. Nevertheless, to maintain and strengthen international scientific excellence and to attract top scholars and researchers from abroad additional efforts will be needed.

Centre for Ageing and Supportive Environments – CASE

Drawing on disciplinary areas within the Faculties of Engineering (LTH), Medicine and Social Sciences the Centre focuses on environments to support older people. It has subsequently acquired the status of a network within Lund University and has representation in the Faculty of Law. Over its 10 years of funding it has concentrated on three sub themes: Ageing and Housing; Ageing and Public Environments and Ageing and Disability. Themes of Ageing and Technology and Ageing and Social Rights have been added to their portfolio. Other areas have built on the strong interdisciplinary links within Lund University particularly with neuroscience.

Scientific quality and quantity

CASE has significantly and consistently contributed to environmental gerontology through its conceptual and methodological approaches. Two areas are of note where CASE is world leading: 1. The Enabler concept funded by an EU grant, developed under the theme of 'Ageing and Housing', is recognized as cutting edge in assessment of the environment and has considerable 'reach' in its impact on methodology, being used extensively across Europe and beyond. 2. Another international flagship is CASE's research focus on participatory methods and co-production of research with users (through innovative Research Circles) particularly older people. Their work imbeds this approach through all research and has been used as a model by other groups. The strength of the Centre is evident through increasing publication in high quality peer reviewed international journals (eg. The Gerontologist) including interdisciplinary journal articles that are recognized as world leading. This has not excluded more accessible publications alongside for a user audience which has high impact.

Research Environment

Concentration of the Forte funding on administrative support, junior researchers and on workshops and retreats to target grant capture was a successful strategy to build capacity and secure 131 million SEK in external grant income during the funded period (with significant EU funding and collaborations). A recent position of a Scientific Coordinator has been added to the team and together with a new process of developing research bids has brought success for CASE.

Recruitment has successfully resulted in gender balance, although the dominance of women and recruitment of men into this disciplinary area remains a challenge within and beyond CASE.

CASEs list of collaborators is impressive particularly internationally. The research environment fosters a cross fertilization of ideas and approaches and engages early career researchers in working with international visitors.

Strong leadership has been a feature of the Centre, providing a role model for future researchers. Succession planning will be critical. CASE recognizes that the style of leadership will need to change with the status of a network-oriented centre where each participating faculty hosts different ageing initiatives.

Research School

Building research capacity has been a hallmark and driver of the research school. Eighteen PhD students graduated over the ten years of funding. CASE has taken career development seriously, engaging ECRs in research applications and publications, moving assistant senior lecturers to permanent positions.

CASE has successfully been instrumental in developing education in ageing and health through a contribution to bachelor and masters' level education and is the coordinating hub in SWEAH (involving 16 partner universities across Sweden). Eighteen students graduated during the Forte funding period. Multi- inter- and trans-disciplinary approaches as well as collaboration with users are a feature of CASE's teaching in the school as demonstrated by the student representative at the hearing.

International visibility of the PhD body at the mid-term evaluation was not evident. This now has been rectified through targeted recruitment and engagement in a summer school, hosting students, post docs from Universities abroad and international study trips.

Internationalization/ International visibility

There is good visibility on the international stage through joint projects and co authorship as well as major conference attendance, and a new website. Strategic collaborations have been developed with several international centres including 20+ countries such as Latvia, Canada, USA, Australia and China.

Social Impact

User involvement is a flagship area for CASE. It established a User Board in 2010 consisting of older people, family members and organizations that support them to co-produce research, comment on and disseminate the findings. The Centre has a high profile in the media and in policy circles. Collaboration with users has been central to the research portfolio with attention paid to communication to users through a variety of channels and public events. Outreach and public engagement are key areas of activity for the Centre to disseminate their work.

Strategic planning for the future

CASE is highly regarded by Lund University, being an internationally recognized brand of research excellence, which has influenced the strategic priorities of the university. Consequently, CASE has been given continuation funding by Lund University (Vice-Chancellor and the Faculties of Medicine and Engineering amounting to 1.5 million SEK) and has been designated as a network-oriented long-term Centre. Its focus on global challenge of ageing populations and their environmental context fits well with the university strategy with its focus on global challenges. CASE's success externally (throughout the ten years of Forte funding and subsequent grants for the UserAge project with Forte programme grant funding for a 6-year and 8-year SWEAH funding) has been recognized internally through investment from the university. Its future focus includes new constellations of collaborators and a diversity of funding sources.

Summary Evaluation and Recommendations

CASE has become, via centre funding, one of the major global centres on ageing and supportive environments. It has broadened its portfolio over the ten years of Forte funding. In taking CASE forward:

1. It is important that CASE defines what a network can offer while at the same time ensuring the Centre does not lose or dilute its identity and reputation globally.
2. There are also opportunities for closer integration with social sciences
3. CASE could take the opportunity of working closer with ARC building on teaching and research collaborations.

Stockholm University

Human Society as a Lifelong Determinant of Human Health – CHES

Scientific quality and quantity

The research output of the CHES Centre of Excellence over the ten years of funding is extremely impressive, both in terms of quality and quantity. Initially, the Centre enabled researchers to offer core team members funding opportunities and to develop a coherent longer-term research program. While a distinct profile on health inequalities was already established, the Centre enabled the group to expand topics and to extent cooperation, both across disciplines and across local institutions (Karolinska, other departments of Stockholm University, including SOFI). This process resulted in the definition of four main areas of investigations: 1. Childhood conditions and childhood health; 2. Early origins of adult disease and transgenerational processes 3. Socioeconomic conditions, work and welfare policies; 4. (and more recently) Migration and health.

An internal evaluation and discussion process initiated after midterm concluded that these areas were best suited to match the interests and skills of the teams. At the same time, they were considered broad enough to allow further scientific inquiry. Although each area produced high quality scientific outcomes some distinction becomes obvious in terms of innovation and international impact. For instance, within area 2 (early origins of adult diseases and intergenerational processes), new insights into the influence of grandparents on grand children's health, derived from Swedish birth cohort studies, are of particular originality. This is also confirmed by the fact that the leading scientists of these investigations were recently awarded by a substantial new grant on this topic (RELINK). Within area 3 (SES, work and welfare state policies) findings derived from cross-country analyses of associations between welfare state performance and the narrowing of health inequalities are of special interest. This research team has also had most visible impact on activities at the level of social and health policy (see below). Clearly, additional excellent single contributions were achieved within each one of the four areas.

Considering the 30 original papers with highest impact, published since 2008, a clear increase in number and importance becomes obvious. The Centre has been successful in publishing some of its best work in highly ranking international journals. At the start of this Centre, probably no one would have expected this achievement, a clear sign of success of the Forte funding initiative. Equally important, international scientific collaboration was steadily growing during the program's lifetime, thus strengthening the international visibility of Swedish research in this domain.

Research environment

These highly remarkable scientific achievements, combined with an efficient organization, management and leadership of the Centre, were the prerequisites of its successful growth. During its final stage of funding the Centre was not only able to attract two large research grants (RELINK and SMASH evolving from areas 2 and 4), in addition to several smaller grants, but, most importantly, to become part, together with SoRAD, of the newly established Department of Public Health Sciences within the Faculty of Social Sciences at Stockholm University. Again, this institutional breakthrough could not be

anticipated at the start of the Forte grant, and it demonstrates the fruitful long-term effects of this funding initiative.

The Centre was able to intensify scientific collaboration with Karolinska Institute and with other departments at Stockholm University, resulting in the formation of cross-disciplinary research teams and grant applications as well as in formalized teaching and training programs. This is best illustrated by the Research School developed by CHES since 2013 (in collaboration with the Stress Research Institute) as a postgraduate program in Public Health. Regular courses and seminars are offered along an established curriculum, where PhD students and postdocs of the Centre are the main participants, enriched by doctoral students from other departments and institutions. Importantly, the Research School has developed links with other Nordic schools (esp. Helsinki and Copenhagen), resulting in a transnational Nordic doctoral conference and networking initiative (NODE). Within the Centre, some 30 PhD- students are currently involved in this training program.

Training programs and research projects offer excellent opportunities to recruit young researchers and to support their career development. Stockholm University and CHES established transparent criteria and rules for recruitment and career advancement of scientists, most explicit with regard to gender equity. CHES must be considered a model of good practice in this regard, as a full gender balance in leading academic positions is almost achieved.

Internationalization and strategic planning

Several research teams in this Centre have established close international scientific collaborations, sometimes resulting in participation in EU grants (FP7) and in funding from NordForsk. It is impressive to see the list of eminent international scholars collaborating with researchers from the CHES Centre. Perhaps, one would have expected visiting professorships from some of these scholars at Stockholm University in order to develop further some collaboration.

The Centre initiated a 'Research Positioning Exercise' where 41 influential international experts were asked about knowledge gaps and challenges in research on health equities in the near future. The integration of this international input into the existing research program at CHES provides a solid basis for strategic planning of the Centre's future profile. In essence, the established areas are expected to grow, with special emphasis on migration research, and it will be an important task to maintain a balance between diversity of topics and extension of personnel on one side and scientific substance and leadership on the other side.

Social impact

The lifetime of this Forte Centre was an almost perfect match with a period of increasing public awareness of social inequalities in health and of political pressure to reduce these inequalities in Sweden by distinct policy measures. Therefore, CHES played a prominent role as a centre of expert advice. Several researchers served as members of influential international and national commissions (WHO Commission on Social Determinants of Health, 2008, Review of social determinants of health in the WHO European Region, 2014; Swedish Commission for Equity in Health 2017). Moreover, the Centre was involved in a range of collaborations with political stakeholders and NGOs at the regional and local level. 'Sustainable Malmö' and 'Save the children' are just two examples. In all these instances, the Centre provided data analyses and interpretations, proposed recommendations, and developed tools for implementation. Finally, the Centre developed a highly efficient strategy of disseminating scientific findings to the larger public and to stakeholders, making use of modern communication tools.

The Centre's appraisal of the Forte grant

It is important to know how the Centre appraised this generous long-term funding provided by Forte. As mentioned, at its start in 2007, this grant offered crucial support of researchers in a time of economic uncertainty, enabling them to continue their contracts, to develop a coherent longer-term research program, and to expand the range of research topics, including cross-disciplinary cooperation. Importantly, the grant provided the stability and temporal frame to establish a coherent scientific approach and, at the same time, to develop some risk-taking innovative explorations. The mutual fertilization of research and training was a direct consequence of the network building evolving from the Centre. Furthermore, the grant enabled the development of an extremely valuable scientific infrastructure in terms of data storage (esp. birth cohort studies), data analysis, and secure funding of cohort studies, among others. Finally, with the growth of collaboration across disciplines new synergies became manifest, and a culture of striving for team excellence, rather than individual excellence emerged –probably one of the most important consequences of this funding initiative. At the same time, a 10- year funding period under the umbrella of one overarching theme may run the risk of preventing flexibility, rapid take-up of innovative developments and ideas, and it may also absorb substantial time and energy for management and control.

Taken together, in case of CHESS, the positive aspects of the Forte Centre grant clearly dominate, given its very impressive achievements and its excellent opportunities of further growth and success.

Summary evaluation and recommendations

In case of CHESS, the Forte Centre of excellence was a particularly successful funding initiative that allowed the centre to develop a research profile with international visibility and to recruit a new generation of researchers with promising scientific potential. All main evaluation criteria were fully met, and with the centre's inclusion into the newly established Department of Public Health Sciences at Stockholm University a solid and stable institutional structure for its further growth was put in place. The centre has already been successful in attracting new research grants that provide a convincing basis of future achievements.

Social Change and Inequality across the Life Course: Sweden in a Comparative Perspective – SOFI

Scientific quality and quantity

The Forte Centre at SOFI has been one of the smaller centres in the Centres of Excellence programme, and it has been an integral part of the research institute SOFI. Consequentially, it has been associated with SOFI's three research areas, labour economics, level-of-living research and social policy research.

In particular, research during the reporting period has looked at, first, intergenerational income mobility, and more broadly the role of family background, for relevant outcomes in adulthood. SOFI Researchers have contributed to publications using both Swedish data –including powerful register data – and cross-national comparative data. Second, there has been work on continuing the Swedish Level of Living Survey (LNU). LNU is one of the longest running longitudinal social science surveys in the world. It is particularly suitable for understanding how inequalities in different life domains are connected and how they evolve over the life course and historically. While data collection for LNU 2010 was externally financed, funding by the Forte centre has been used for research competence in the management of the survey. Finally, causes and consequences of social policy have been analysed predominantly in terms of socio-economic class and gender. Much of this research has been comparative in character and has based on cross-national institutional data from the Social Policy Indicators (SPIN) Database established at SOFI. Publications using SPIN data have analysed, for example, child poverty and family policy institutions, active labour market policy and poverty, unemployment benefits, job insecurity and subjective well-being as well as labour markets. There has also been research on issues of welfare and housing such as a study on changing work-life inequality in Sweden or an analysis of the long-term consequences of growing up in a poor neighbourhood.

Research activities during the funding period have been very consistent with previous work. This means that research at the Forte Centre has been continuation of an established research programme rather than radical innovation or the establishment of a new research agenda. However, research questions have been responsive to societal change.

There has been a deliberate concentration on high-level international journals in economics and social sciences. Publications from SOFI have made important contributions to the field of stratification research in both substantial and methodological terms.

In addition to the scientific output, which concentrates on international journals, there have been several research reports and popular publications for a broader audience.

Research environment

SOFI is a well-established research institute and is internationally recognized in its areas of specialization. The Forte centre has accounted for a comparatively small proportion of SOFI's overall funding. A large part has come from Stockholm University but also from external sources of funding.

However, due to the limited financial information provided by SOFI, precise estimates are not possible.

Research at SOFI has concentrated on two scientific disciplines – economics and sociology – with selected links to other disciplines. In this respect, the institute resembles a department. While there is collaboration between (labour) economists and sociologists (e.g. in the form of research seminars), the intention is to keep their respective disciplinary profiles.

SOFI aims for diversity in the personnel structure. The gender distribution is mixed though there has not been a full balance. There is a close connection to the economic and sociological departments at Stockholm University not only in terms of scientific exchange but also in terms of mobility of researchers (though this is not an explicit strategy of the University).

Research school

No separate research school has been established in conjunction with the Forte Centre. However, a new cohort of doctoral students was recruited, not least in connection with LNU 2010. Funding from the Centre has been important in facilitating the training of a new research generation. During the reporting period, 8 students completed their PhD.

Internationalization/International visibility

SOFI is internationally recognized in its areas of specialization. It can draw upon an extensive network of contacts. Many of them are personal or project-based, but there are also long-established institutional contacts. Various international scholars have acted together with SOFI researchers as co-authors in writing international publications. As a well-established Swedish research institute, SOFI has a specific asset: The possibility of access to comprehensive register data is attractive for many international scholars.

In spite of international advertising and a mix of strategies in the recruitment of PhD students, postdocs and senior researchers, the large majority of researchers are from Sweden or Scandinavia. Particularly close are the connections with Stockholm University. Many PhD students as well as research scientists have been recruited from the University. On the other hand, for example the Department of Sociology at Stockholm University has many previous SOFI researchers and graduates among their lecturers and professors.

Social impact

Questions of social inequality, mobility and social policy have undoubtedly important practical implications. Apart from the distribution of research results in the scientific context, SOFI has made various efforts to communicate relevant results from research projects to policy makers and the public. In particular, it has produced various non-scientific reports in Swedish language. For example, with each new wave of the LNU survey, a book in Swedish has been published. Non-scientific publications have appeared in public debates on a variety of social topics. They have also become textbook resources in many educational programs around the country.

Knowledge transfer has been directed mainly to the government, and there are also established links with policy makers. Private industry has so far received relatively little attention. However, potential in this respect (e.g., collaboration with insurance companies) could be further explored.

Strategic planning for the future

Given the full integration of the Forte Centre into the institute, no efforts were made to preserve the Centre as a unit beyond the period of funding. However, various applications

for successive project funding have been successful, including a large Forte programme grant. This has helped to secure the continuation of the overall research programme.

Concerning future planning, there have been some reservations about differentiated, top-down implemented research strategies. However, since the end of the Forte Centre, a new generation of scientists has taken responsibility in the management of the institute, and the future practices of governance are yet to emerge.

Summary evaluation and recommendations

SOFI is a well-established research institution with international visibility in its fields of specialization. Research focuses on comparatively few areas, but over many years, there has been a cumulative stock of expertise, and the scientific output has been disseminated in high-level journals.

SOFI has opted for an integration of the Forte Centre into the institute, not for highlighting it as a special unit and establishing a new research programme. This makes it difficult to assess the added value of the Forte grant. The Forte Centre has certainly contributed to the continuously productive development of the institute, including data collection, but it is hard to identify its precise impact.

Recommendations for the development of the institute as a whole include intensified efforts for interdisciplinary collaboration, a commitment to explicit procedures and structures of governance and a continuing strive for internationalization not only in research topics but also in recruitment.

Exclusion and Inclusion in the Late Welfare State: The Case of Alcohol and Drugs – SoRAD

Scientific quality and quantity

One of the criteria to indicate research quality is the quantity of articles in international impact journals. SoRAD has produced quite a substantial number of papers in those journals. This is especially true for the contribution of two senior researchers attracted from abroad, even when accounting for the fact that a substantial number of their publications should be seen as product of respectively a later (after SoRAD), respectively earlier (before SoRAD) appointment to another centre. More generally, the senior staff at SoRAD has over the last years, with two exceptions, sufficient output in the category which I consider the mark of 'excellence': international impact journals.

When looked at the three major themes around which the research is organized, the quality of research in two of the themes, (1) consumption patterns, problems and norms and (2) society, policies and their implications, is good to excellent. For the first theme the publications around the cross-country study on the effect of increased availability on consumption and alcohol related harms are unique and have initiated a worldwide discussion about the validity of the theoretical frame (the collectivity of drinking culture) about availability and consumption. On the point of policies, the historical studies of Enefalk and Erdman are unique and provide a fuller comprehension of both the factors associated with adoption of policy measures as well as the (potential) effects. A new line of studies on gambling in this theme has been developed that proved to be fruitful. The qualitative studies on drinking and more specifically the cross cultural qualitative studies are innovative, also and especially from a methodological point of view. What is also remarkable and good is that, next to publications in substance use journals, many of the studies in this program are published in more general, mostly sociologically oriented, journals. This highlights one of the most consistent qualities of SoRAD over the years: the presentation and integration of empirical data in a theoretical and/or conceptual framework, which make these studies more informative than many of the mostly purely descriptive studies on substance use. A more critical point is the relatively low number of studies on drug use in these two themes. The expertise in qualitative research methods would lend itself very well to articulate the lifeworld of drug users and the effect of policy measures on the wellbeing of drug users. The third theme on treatment is, as the first two themes characterized by cross national studies into how alcoholism is defined among general populations and treatment professions. The difficulty in the field of addiction treatment research is that there is no consistent international network of researchers in this field. Also, the cooperation of treatment facilities itself with research is, worldwide, rather meagre and difficult to initiate.

Research environment

Economically, the research environment has been strongly determined by grants from Forte. The centre of excellence grant accounts for 17.8 percent of the budget and 26.2 percent of the funding comes from other types of grants from Forte. Another large part of the funds come from the university (31%). Over the years SoRAD has been able to secure a substantial contribution from 'other governmental sources (14%), however less so from municipalities or counties, the EU, nonprofit and public health organizations. A more general conclusion is that the centre grant has not led to a substantial increase in projects funded by external funds.

An important element of research environment is the extent to which expertise is used to train and educate new researchers. SoRAD plays a central role in the research networks of Sonad and Garn, securing that young researchers in the field can use the expertise of SoRAD researchers to further their own research. Considering PhD's within SoRAD itself, there were 13 PhD's over the whole period of the Forte grant. One of the recommendations at the 2011 mid-term evaluation was to attract more PhD-students and (young) post docs. However, only 3 (of the total 13) PhD-students started their work in 2012 or later. Also, the number of post docs appointed in 2012 or later (1) is very low. With a senior staff of about 14 persons, of which 4 are full time professors, the potential to introduce new (excellent) researchers is somewhat underused. This is not so at all when it comes to recruiting excellent senior researchers. On that point SoRAD has been very successful over the period and these recruitments have contributed substantially to the quality and quantity of scientific output of SoRAD.

An important aspect of the research environment of the permanent staff is the extent to which there is, also on the individual level, evaluation of functioning. It seems that such an element is not structurally incorporated in SoRAD. Yet, such an element can be crucial to keep up consistently the quality of a centre.

The gender distribution of the staff, also a relevant element of the research environment, is overall about 50 percent men and 50 percent women. In the professorships there is an overrepresentation of men, somewhat balanced by the recent appointment of a woman as director of SoRAD.

Internationalization – International visibility

SoRAD can be said to be the most 'visible' and well-known centre in Europe and even worldwide, especially in the field of alcohol research. More recently it has been building up a good reputation in research on gambling. The internationalization shows, among other things, in being able to attract very good researchers from abroad. It shows also in initiating and participating in alliances with top researchers elsewhere in the world. More specifically the internationalization shows in many cross national/cross cultural projects, that structure and inform the discussion about basic issues in the field of alcohol epidemiology (e.g. the connection between availability and consumption; the (almost) worldwide trend of decreasing consumption among adolescents; the cultural embeddedness of drinking). Very innovative, also internationally, is the introduction of more qualitative methods (and associated concepts) in cross cultural research on alcohol consumption.

Social impact

One way to measure social impact is the number of articles published in more local (rather than international) journals. This has been done by SoRAD researchers in abundance securing that all relevant findings and discussions also find their way to the more general public and professionals involved in prevention and treatment of alcohol-related problems. Traditionally Sweden has in Europe a rather unique position in that alcohol policies are a very important part of the political discussion (similar to Finland, Norway and Iceland) and even more unique in the officially adopted goal of a drug free society. This means a rather responsive government towards research findings concerning alcohol and drug use. SoRAD has used this responsiveness to further social impact, however, perhaps somewhat more in the field of alcohol than in the field of drug use. The number of projects evaluating the effect of and or implementation of interventions (other than national policies) is rather modest. Here there is a potential to increase social impact.

The future of Centres of excellence

The representatives of Stockholm University, when interviewed about the centres of excellence, said about the future of SoRAD that they definitely wanted to secure the competence SoRAD has in the field of alcohol research. SoRAD, in their presentation, also stated that they felt supported by the Stockholm University. The university representatives noted also that in itself, SoRAD is a rather small centre with relatively small amount of external money to fund projects. Hence their decision to combine CHESS and SoRAD in a new department of Public Health Sciences, in which both SoRAD and CHESS will have the status of internal departments. Two lecturers have been appointed, meaning that at least part of the increased teaching load expected of SoRAD (and CHESS) researchers will be compensated. SoRAD may profit from the increased chances as part of a 'department' to acquire PhD students and to further gambling research. However, it will most certainly be a challenge for the future to find comparable funding as Forte has provided in the last ten years in the form of Centre and program grants.

Added value

The period over which the Forte Centre grant extended shows that in other Scandinavian countries (especially Finland and Norway) and other European countries like England, Netherlands and France, most of the institutions or departments specialized in alcohol and/or drug research strongly reduced the staff or were abolished. It is most certainly thanks to the Forte centre grant that Sweden, and more in particular SoRAD, has been able to maintain and develop its expertise and is, also internationally, recognized as a Centre of excellence in its field. The impression is that over the years the maintenance and further development of the expertise of the staff had greater priority than the development of new, preferably externally funded, projects and the acquiring of PhD's.

Summary evaluation and recommendations

The Centre grant allowed SoRAD to maintain and further its position as (also) an international centre of excellence in the field of, especially, alcohol epidemiology, alcohol policy and to develop a very promising line in gambling research. The university has throughout the grant period been supportive of SoRAD and their initiative to fuse CHESS and SoRAD in a new department of Public Health Sciences, with SoRAD as an 'internal' department is further sign of the support of the University for SoRAD. The new position of SoRAD will most certainly help to further diffuse the expertise of SoRAD in bachelor and master programs and may have a positive effect on acquiring PhD's and externally funded projects.

Umeå University

Centre for Global Health Research – CGHR

Scientific quality and quantity

The Centre has been very active in the scientific production with well over 1000 papers in ten years. In addition, the quality of the production has been on high level, including close to 30 Lancet papers and a significant, leading contribution to the Lancet Commission on Health and Climate Change. The Centre also established a scientific journal Global Health Action, which is now published by Taylor & Francis. The journal became a success by first mentoring young researchers from the third world countries; now the journal has matured and receives papers normally from seniors. It was also the time to start an Open Access journal. One special feature of the journal has been that it has initiated special initiatives where invited PhD students can write a summary of their dissertation.

The Centre's profile has covered global issues ranging from global south to global north and has dealt with five central themes of epidemiological transition, life course interventions, primary health care, gender and health, and climate change and health – and an overarching theme of research to policy. E.g. for cardiovascular diseases, the Centre has produced important research on interventions and has contributed to showing that this welfare disease is present in developing countries. Further, health system policy questions have grown and now, the Centre has one of the strongest groups in Sweden on health economics.

International scientific achievements such as new methods for verbal autopsy are noteworthy. Also, the Centre is a WHO collaborative centre for verbal autopsy. Despite the wide range of themes, the Centre has created a high-level and specific expertise in the international context of global health research. It can be said that the Centre achieved its goals to become a visible, established research group in global health; at the same time, it has essentially contributed to capacity building in global south.

Research environment

The Centre has functioned as an active multi-disciplinary research, researcher exchange and training hub for many researchers including those from developing countries. In Sweden, the Centre has initiated new interactions and synergies with several other research groups within the university. Internationally, the Centre has had wide networks and collaboration with academia, NGOs, international agencies and governments.

Active capacity building has been done to support the global south development by hiring temporary staff members at the Centre from developing countries. It was noted that due to geographical position of Umeå, personnel recruitment is quite a challenge. In addition, the Centre has actively contributed to methods development, intervention development and from research to policy development. Gender research has become a cross-cutting issue in all themes of research in line with research into policy and practice. The Centre has attracted co-funding from Umeå University and major European Union grants.

The Centre contributes to master programs in global health; one-year master and a two-year research-based master programs exist. The latter feeds into the PhD pool of the Centre.

Research school

The Centre co-hosted Swedish National Research School for Global Health with Karolinska Institute, which was separately funded by Forte and the Swedish Research Council. The collaboration went very well allowing PhD students to move between different departments, meet seniors and take flexibly part in meetings, workshops, mobility grants and so on. A relatively high number (n=74) of PhD degrees, many of them from abroad and developing countries, were granted in the evaluation period.

Internationalization/International visibility

The Umeå Centre is an internationally visible research and training centre in global health issues. It has achieved a strong position in research methods and applications in different cultural contexts. Its exchange program is well-known and appreciated. The Centre has also created sustainable exchange programs which avoid brain drain from global south to north. In addition to its global focus, dissemination has also been done in Swedish in Sweden e.g. via special events and declarations plus social media.

Social impact

The Centre has shown societal responsibility by advancing research and training widely, including low resources countries in global south. By creating methods such as verbal autopsy, by its research on domestic violence and breastfeeding practices as well as by implementing interventions in different cultural contexts, the Centre has been able to influence local practices, procedure and structures.

Also, the Centre was a leading institution in the 2015 commission on Health and Climate Change and the follow-up Lancet Countdown to 2030. Direct impact with e.g. industry is not relevant due to the character of the Centre work; however, it is of fundamental importance to convince governments (in global south) to understand and act to know who their people are.

Strategic planning for the future

The Centre has developed its structures and staff with their competences largely based on the 'glue' function of the Forte grant allowing flexible hiring and increased collaboration and networking. The last years of the Centre have been rather challenging due to uncertainty of long-term research funding; it has tried to find out how best to continue post-Forte and guarantee continuity and keeping competent staff members. At the time of the evaluation, however, it seems that the Centre is on its way to be re-structured as a department and part of the medical faculty. The expectation is that the department structure and the faculty as the primary resources allocation level, would bring some sustainability to the Centre work when the Forte funding is over, but the staff needs to compete with other departments for the resources. The Centre staff sees it as a necessary and natural step to build collaboration, first across departments and later across faculties especially with sociology, social work and medicine.

Summary Evaluation and Recommendations

The Umeå Centre for Global Health has achieved a very good, valuable and visible international role in the global health research and research training area. This is corroborated by its scientific publication output, PhD training and exchange programs but also by the societal impact of its implementation and methods development work especially in the global south but also in the global north.

Based on the evaluation it can be recommended that the Centre's high-quality research and training work and investment in the capacity building could find relevant support also in the future.

University of Gothenburg

Centre for Epidemiologic Studies on Mental and Physical Health Interacting over the Lifecourse – EpiLife

Scientific quality and quantity

The scientific production of EpiLife has been good (over 1700 papers listed) and has grown during the ten years of the Centre life. EpiLife has added to the knowledge base in life course epidemiology, especially from the multidisciplinary approaches ranging from molecular to environment, psychosocial and environmental perspectives. The papers have been published in good quality journals including *Circulation*, *Archives of Internal Medicine*, *New England Journal of Medicine* and *Lancet*.

The Centre is described as one of the flagships of University of Gothenburg and is well known in Sweden and abroad; internationally e.g. IDEFICS study is one example. Especially research in cardiometabolic disease, nutrition and physical activity from early life course are the focus now. The research is mostly traditional epidemiological risk factor research with not so much explicit theoretical underpinnings; however, some more comprehensive approaches have been introduced such as large-scale studies on socio-economic factors and mortality and more specific implementation intervention studies in post-partum lifestyle topic.

Research environment

EpiLife has built its research work in four research areas (psychosocial factors and cardiovascular susceptibility; mental health, age and ageing; obesity over the life course; cognitive functioning, normal ageing to dementia) and four core areas (biomarkers and genetics, data management and statistics, communications and transfer, and administration). These research and core areas aimed to work in multi-disciplinary way combining expertise and data for comprehensive epidemiological analysis. This kind of collaboration seems to create good conditions for productive work and for participation in large scale projects also internationally.

EpiLife has ten research groups; it has been active in creating networks and different forms of collaboration within its own university, nationally and internationally. Within the own university, especially collaboration with nutrition and sport science is deemed important to strengthen the work areas. EpiLife has been good at getting external funding, too.

EpiLife has had challenges in creating and maintaining close collaboration between its geographically scattered teams; however, this has been dealt with increasing networking and workshops by supporting groups e.g. for juniors such as FUTURES with its working groups, which arrange regular breakfast meetings for new research ideas, grant writing workshops etc. For the Centre it is vital to be close to Sahlgrenska Hospital due to the access to patient material. A way to create closer collaboration is the support of professors so that they can work at the centres as senior advisors.

In the recruitment the Centre has tried to attract staff members from other disciplines such as psychiatry and it has had a reasonably good gender-balance. It did not become explicitly clear if and what kind of recruitment strategy, exchange programs, career development support, leadership structures and collaboration with other research groups (for cross-fertilization) are in place.

In 2018 EpiLife ended and is now called EPICENTRE. Earlier on, ageing research was concentrated in AgeCap, which is a University of Gothenburg Challenges centre, which the university supports financially via its strategic co-funding.

Research school

EpiLife has had no formal research school; instead, it has focused more on individual (though interdisciplinary) courses and Sahlgrenska Hospital to educate young researchers. This 'virtual' research school has organized courses such as life course epidemiology, research seminars, writing courses - in collaboration with two other research schools at the university. EpiLife has had many PhD students anyway (almost all of them from Sweden); 89 PhD students during the ten years of the Centre.

Supporting young career development seems to have happened via successful researchers teaching/showing how to apply for grants and write articles; PhD students have had training and tests in lecturing. The hearing revealed that there are university-level career programs, though no details were given. Also, the commitment to recruit junior faculty members, was mentioned though not elaborated.

Junior work is supported by different networks: FUTURES network was created based on the discussions with the advisory board. The FUTURES network has a structure for rotation among the young researchers. When AgeCap was created, EpiLife started Green House and now the collaboration is better both in Green House and FUTURES. Now there is also EpiLife – Teens.

Internationalization/International visibility

Especially project-based collaboration and networking has been active: an example is IDEFICS project. The extent of strategic collaboration between universities e.g. via mobility and exchange programs seems to be less pronounced.

Social impact

EpiLife has kept its profile as risk factor researchers using large data sets to produce more information on the risks of morbidity and mortality. Thus, there has been less explicit emphasis on the study of the larger picture of illness e.g. based on theoretical approaches, multi-level analysis etc. The hearing interview emphasized that the 'group consists of researchers; they are not implementers'; however, in the interview session, both a rather informative approach of using socioeconomic status to study all-cause mortality was given; further, a useful example was given about an intervention study with implementation perspective. On the other hand, the self-evaluation report by EpiLife says that some of their activities have had direct policy implications such as intervention material for IDEFICS intervention, which led to using the material by public health departments in Sweden to promote healthy diets and lifestyles among children. Clearly there is a tendency to look more widely at diseases in the context, which is very welcome. The EpiLife transfer core area has done active dissemination of its research and its findings via different activities, training programs of lifestyle ambassadors, media and meetings.

Strategic planning for the future

Now AgeCap has been formed as a separate entity and EpiLife has transformed into EPICENTRE, which the University supports. It looks as if especially cardiometabolic disease and physical activity in the life course perspective will be the focus in the future. According to the Vice-Chancellor, also global health would be one of the new areas at the university.

In this new situation with new research groups and structures and potentially new themes, challenges remain in the governance, especially in the development of strategic approaches, leadership, career development and support, and training of juniors. The roles of FUTURES and SYNTHESIS structures clearly need university support in the transition period.

Summary Evaluation and Recommendations

EpiLife has been very productive and visible in its multi-disciplinary life course epidemiology research, also in international research projects. The Centre has evolved and been re-formed into AgeCap, which is now a separate entity and a new faculty-supported structure EPICENTRE. Keeping coherent and sustainable infrastructure and strong leadership and good governance in place to support especially junior career development can be a challenge in this changing environment. Furthermore, moving from rather traditional risk factor epidemiology towards more holistic and multi-level research approach - and potentially towards intervention research to bridge the knowledge gap between research and practice/policy development, would improve the impact of the centre in the society and in the research development globally.

4. The Forte centres of excellence – general observations

Across all centres, it is obvious that the centres have had a major impact on the research environments funded as Forte centres of excellence. In the questionnaire as well as during the hearings this particular form of funding was discussed, as “pros and cons”. Perhaps unsurprisingly, the positive aspects dominate the picture.

In a majority of the nine centres of excellence receiving the Forte grant we observe successful developments in terms of impressive scientific achievements, of recruiting young researchers nationally and internationally, and of strengthening innovative trans-disciplinary research. Therefore, the aim of increasing international visibility and competitiveness of Swedish research in these scientific fields has clearly been met. Moreover, several centres were successful in establishing stable institutional arrangements and infrastructures, and in attracting substantial external funding, thus continuing and expanding the research and training activities initiated by the Forte grant.

These successes are largely due to the particular strengths of this Forte funding format. They include (1) the provision of a longer-term perspective of research planning and development, (2) the support of innovative research initiatives across disciplinary boundaries, including opportunities of scientific risk taking, (3) the creation of a ‘critical mass’ of research teams dealing with agreed-upon topics, (4) the combination of high quality research with new training programs (in particular Research Schools), and (5) a substantial increase of international collaboration and exchange. The boundary-crossing has been one of the most important aspects of the centres, in creating new collaborations across disciplines, sometimes also across faculties (or equivalent) and even universities. The grant has enabled very strong research environments to invest time and effort in collaborating with partners that may not have been approached otherwise.

In addition, the timeframe of Forte funding allowed centres to develop crucial infrastructures to secure the collection, storage and analysis of cohort data, often a unique Swedish treasure in a worldwide perspective. The emphasis on communication strategies and dissemination of research results have also had an impact.

In some areas, not yet matured as scientific fields, the grant has contributed simply by shedding light on these areas and making them recognized internally at the university and externally. The concept critical mass seems to be important in this respect, albeit differently defined depending on scientific area and centre. Increased national and international visibility has also been frequently mentioned as one of the cons with this form of funding. The centres contribute to the branding of their universities in a significant way. The centres have also been very active in applying for external grants; many of them have been very successful as well. Some even described the Centre of Excellence grant as a platform enabling a sustainable grant writing platform.

One of the most often mentioned advantages with the Forte grant was in the words of one of the interviewed university representatives: “The importance of the centre is that in that way the horizontal (interdepartmental/ interdisciplinary) organisation gets more impulse over the vertical departments”. Almost all university representatives mentioned this as a great advantage of centre grants. The context of this is also the fact that in most, if not all cases, social and humanity faculties have far less research capacity to bring in into cross-/multidisciplinary research themes than medical or technical faculties.

The centres also provide long-term planning and development opportunities. The Centres were generally speaking very positive towards long-term open funding options. The timeframe is important and many lauds a longer funding period. Given the time it takes for

research environments to be built, not least when it comes to the actual recruitment, the usual three-year grant can be challenging for researchers. Having said that, very few centres have identified any weak aspects of this kind of grant, except one – termination. Also mentioned was the balance between individual researcher's freedom to develop their research and the need to keep the objectives of the original research plan alive over a long period of time as well as a reasonable level of output. This requires an active dialogue and a proactive leadership. During the evaluation the succession issue was also addressed. Some centres have experienced a generation shift and others need to prepare for a transition as regards research leadership.

Leadership is also important at the institutional level since co-funding and explicit support was a formal requirement for the funding. Some of the centres were selected in tough competition internally. Ten years is a long commitment also for the university in question and typically, the vice-chancellor has been replaced during that term and the post Forte lives for centres appear very different. Some have been consolidated as centres, others have become more network like and others have reached a more permanent status as departments depending on institutional profile and approach to scientific organization. Following from this, for some environments the ending of the Forte centre has been more dramatic than for others. Most if not all centres seem to have secured continuous funding from external sources before, during and after the centre term. The internal support, from the university management, varies significantly.

At the same time the Forte Centre of excellence initiative has some weaknesses that need to be avoided in any future research policy planning. With a 10 years funding period substantial financial resources are fixed, thus preventing shorter-term re-allocation of money, e.g. in case of rapid emergence of unanticipated new methods and research hypotheses. Furthermore, a centre's performance may not meet the initial expectations of excellence or may not be able to develop a unique centre-specific profile, distinct from its previous work. In consequence, both the initial evaluation and the midterm evaluation need to be very critical, with an increased probability of turning down centres at midterm. However, the emphasis on creating a unique centre profile and the branding/communication aspects of the centre needs some further discussion. This was also the main focus in the first evaluation. Nevertheless, the centres have been very successful attracting other big grants from numerous funding bodies, each with their own expectation on branding and visibility (as shown in the typical acronym). The balance between the expected novelty of the centre and alignment with existing structures needs to be discussed. As this evaluation shows, centres as well as excellence can appear in many shapes.

The Forte initiative was not successful in imposing binding commitments to the Universities concerning the amount of internal centre funding and concerning the post-funding period of the centres' continuation. The continued commitment from the HEI differs significantly and should have been discussed well in advance of the termination of the grant. Moreover, research policy plans should have been put in place some two or three years before the end of the Forte grant. However, the responses to the continuous co-funding demand from HEIs need to be assessed as being in line with the profile of the university and its strategies. There also needs to be flexibility in terms of how centres are perceived at the university. For some HEIs, centres are a normal and permanent organization form should they be successful raising the necessary funds. In some HEI contexts, the centres are by definition temporary organizations that could be replaced by a department as a "next step". In yet other cases, centres become networks coordinating and promoting international, national or internal (interdisciplinary) collaboration.

In the interviews with senior (and junior) researchers of the centres themselves the uncertainty about the future and the (potential) loss of good researchers of the centre were strongly brought forward as a major problem. It has become commonplace to describe researchers on temporary contracts and the potential “loss” of them as a problem. The centres are in a way a double-edged sword in this respect. On the one hand they provide opportunities for researchers, postdocs and PhD students, on the other hand these people are there only because of success in grant applications. The heavy dependence on external funding (which comprises more than 50 percent of the total funding in Sweden) makes the system a bit shaky. Centre of Excellence are in this respect somewhere in between direct state funding and the typical three-year grant.

In conclusion, the Forte Centre of excellence funding format has been a successful initiative that has largely met its initial goals. It should therefore be maintained, but applied under more restrictive conditions, with still a higher degree of scientific competitiveness and more rigorous midterm evaluation procedures. In many, but not all of the funded centres the scientific achievements have been outstanding or excellent. Future funding decisions should be based on even more challenging standards of scientific quality, thus restricted to grant applications that demonstrate a high probability of meeting these standards. In consequence, the overall proportion of funding devoted to centres of excellence might be reduced in favor of increased project funding.

The added value of the Forte centres of excellence seems to have been considerable. The long-term funding provides a stable platform for risk-taking, e.g. in relation to higher publication ambitions and interdisciplinarity. The main challenge for centres is to prepare for the time after the grant period and this evaluation has shed light on a number of post funding strategies: continuation as centre, further development as network (sometimes with broader scientific scope) or department (with stronger links to education).

5. Recommendations

The Swedish Government

- Based on this evaluation, Centres of Excellence should be considered a successful form of funding and deserves its place in future research policy investments.

Forte

- Important to follow more closely the development of the Centres and in particular to provide an evaluation a couple of years before the program ends. This would better help the Centres prepare for the end of financing.
- Facilitate collaboration between Centres, since lessons learned in individual Centres will not necessarily bring cumulative know-how.
- Ensure an ongoing dialogue between Forte and the Centres based on light touch reporting and enhancement focus.
- Ensure future centre funding tails off and there is a sustainability plan in place
- Recognize the importance of capacity building and supporting early career researchers and PhD students in the funding options going forward.
- Remain open to a variety of organizational structures and leadership styles of centres. Some centres may develop a unique brand primarily based on the specific grant whereas others may change organization less dramatically but still be able to deliver research of the utmost quality.

6. Appendix

List of applying and granted Higher Education Institutions

HEI	Applications	Granted
Karlstad University	1	0
Karolinska Institute	4	2
Linköping University	3	1
Lund University	4	2
Malmö University College	1	0
Royal Institute of Technology (KTH)	1	0
Stockholm School of Economics	1	0
Stockholm University	3	3
Umeå University	3	1
University of Gothenburg	4	1
Uppsala University	2	0
Växjö University	1	0
Örebro University	1	0

List of Forte centres and research schools

Gothenburg university

Forte-centre: Centre for Epidemiologic Studies on Mental and Physical Health Interacting over the Lifecourse (EpiLife)

Linköping university

Forte-centre: Centre for Research on Migration, Ethnicity, and Society (REMESO)

Research school: REMESO Graduate School in Migration, Ethnicity and Society (2008-2012)

Research school: REMESO Graduate School in Migration, Ethnicity and Society (2013-2015)

Lund university

Forte-centre: Centre For Medicine and Technology for Working Life and Society at Lund University (Metalund)

Research school: Man, work, environment and health (2008-2012)

Research school: Man, work, environment and health. Graduate school at Lund University (2012-2014)

Forte-centre: Centre for Ageing and Supportive Environments (CASE)

Research school: CASE National Graduate School for Ageing Research (2008-2012)

Research school: CASE Graduate School and a National Platform for Graduate Studies in Ageing Research (2013–2015)

Karolinska institute

Forte-centre: Aging Research Centre (ARC)

Research school: ARC National Graduate School for Aging Research (2008-2012)

Research school: Graduate School for Aging Research at ARC (2013-2015)

Stockholm university

Forte-centre: Social Change and Inequality across the Life Course: Sweden in Comparative Perspective (at SOFI)

Forte-centre: Human Society as a Life Long Determinant of Human Health (at CHESS)

Research school: Human Society as a Life Long Determinant of Health (2008-2012)

Research school: Social and individual determinants of health across the life-course (2013-2015)

Forte-centre: Exclusion and Inclusion in the Late Welfare State: The Case of Alcohol and Drugs, ExIn (at SoRAD)

Umeå university

Forte-centre: Centre for Global Health Research (CGH)

Research school: The Swedish Research School for Global Health (2012–2015)

Questionnaire

PART 1

Questions to the Vice-chancellor of the University

- 1) In the grant proposal, it was the HEI that applied. How were the applications selected?
- 2) Has the grant influenced the strategic priorities of the university? If so, in what way?
- 3) Has the university taken new initiatives in co-financing programs, positions or projects at the Centre?
- 4) Has the university any long-term plans for the centre, after the grant period?
- 5) Reflect on the pros and cons of Centre of Excellence grant. How do you perceive Centre of Excellence grant? Is it a good way to finance research? If so, what is good with this type of grant?

PART 2

Questions 6-11 should be answered by the Coordinator of the Forte Centre

6) Research performed

- a) Describe the most important results of the research performed at the Centre.
- b) Describe briefly the quality of the research in an international context (state of the art).
- c) Describe the role the centre has when researchers apply for different grants.
- d) Describe briefly how the research can be developed after the grant period. What is your strategy for maintaining a strong research environment after the grant period?
- e) Are there links to educational programs at the bachelor and master levels?
- f) Comment upon the previous evaluations of 2009 and 2011 and what has been done in accordance to the evaluators' suggestions.
- g) What university policies relevant to the gender profile of those involved in the Forte Centre exist - particularly those related to its leadership? How have these policies been implemented in the centre?
- h) Reflect on the pros and cons of Centre of Excellence grant. How do you perceive Centre of Excellence grant? Is it a good way to finance research? If so, what is good with this type of grant?
- i) List as *Appendix 4* a complete list of peer-reviewed publications by researchers at the centre during the grant period. Mark with an asterisk (*) the publications that are results of new collaborations due to the grant.
- j) List as *Appendix 5* a complete list of peer-reviewed conference presentations by researchers at the centre during the grant period.
- k) List as *Appendix 6* other publications by researchers at the centre during the grant period.

7) Collaboration

Describe the impact of different types of collaborations, such as internal and external, and with different stakeholders.

8) External communication/dissemination

- a) Describe your communication strategy.
- b) What efforts have been made to communicate/disseminate information about the activities and results from the research funded by the grant to different target groups? Please note that that this question does **not** seek to capture details of scientific presentations made to your peers in academia.
- c) Describe how the results have been communicated/disseminated to the public, policy makers, research agencies, etc.
- d) Please list impact through media e.g. newspapers, textbooks, popular science presentations, policies/standards, blogg, twitter and homepage.

9) Participating personnel

- a) List the persons actively participating in the Forte centre during the grant period. Please use the Excel file named *Appendix* for presenting the persons actively participating in the Forte centre, (*Appendix 1*).
- b) Describe strategies for recruitment of researchers and research groups. Have the strategies been successful?

10) Budget and financing of the Forte Centre

This information should be presented in *Appendix 3*, which can be found in the Excel file named *Appendix*.

11) Evaluation of Forte Research Schools

- a) Describe the organisation of the research school?
- b) What is the relation between the research school, the centre and the research done at the centre?
- c) Is there any connection between the research centre and other doctoral, undergraduate or postgraduate courses?
- d) What are the future plans for the research school?
- e) Syllabus and literature lists are to be enclosed (*appendix 8*)
- f) Use *appendix 2* to list doctoral students.

Appendixes

For Appendix 1-3 use the Excel file called Appendix

Appendix 1. Table for presenting the persons (other than doctoral students) participating in the Forte centre, Both researchers and TA-personnel.

Appendix 2. Table of doctoral students participating in the Forte centre research school, or for those centres that has doctoral students but not a research school.

Appendix 3. Economic report and finance plan of the Forte centre

Appendix 4. Complete list of peer-reviewed publications in journals by researchers at the centre during the grant period. Mark with an asterisk (*) the publications that are results of new collaborations due to the grant.

Appendix 5. List of peer-reviewed conference presentations by researchers at the centre during the grant period.

Appendix 6. List of other types of publications by researchers at the centre during the grant period.

Appendix 7. Organisation chart to illustrate how the Forte centre is organised.

Appendix 8. Syllabus and literature list for the research school

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