

NORDFORSK MAGAZINE 2016

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PRIMARY RESOURCES**

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NordForsk

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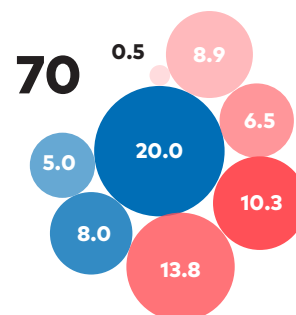


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KNOWLEDGE AS A COMPASS IN AN INTERWOVEN WORLD

The scope and quality of Nordic research cooperation have expanded steadily since NordForsk was founded in 2005. Investment in joint establishment and use of research infrastructure has been, and continues to be, essential to cost-effective production of new knowledge of the highest quality.

One of NordForsk's priority areas is research that integrates input from many scientific disciplines and extends across multiple policy sectors. The aim is to improve the prerequisites for tackling grand societal challenges by providing up-to-date, top-quality knowledge. This will strengthen the base for wise, future-oriented policy-making in the interwoven world of which the Nordic welfare societies are part. The ultimate ambition is to use evidence-based knowledge generated by Nordic research cooperation as a compass to ensure sustainable development in the Nordic region and beyond, in line with the UN Millennium Development Goals.

There is growing international interest in Nordic collaboration, both in general and with regard to research and research infrastructure. The Nordic countries are increasingly seen as role models for other cooperative constellations. This is not least because decisions can relatively quickly be translated into action, thereby generating new knowledge that can be used by policy-makers and others who are seeking to transform challenges into opportunities. Examples of research areas in which Nordic cooperation adds value to what is accomplished in the individual five Nordic countries are: bioeconomy, health and welfare, gender equality, climate, societal security and education.

The Nordic Council of Ministers has launched a modernisation project, "New Nordic Region", under the leadership of Secretary General Dagfinn Høybråten. This reform project incorporates a long list of proposals aimed at ensuring the future viability of Nordic cooperation and realising the vision of the Nordic Ministers for Co-operation of a borderless, innovative and highly visible Nordic region. The overall goal is to increase focus on policy and strategy and improve coordination over time and between sectors. Together, these proposals will create favourable framework conditions for increasing the volume, quality and significance of Nordic cooperation, particularly when it comes to research and research infrastructure.

An important component of the efforts being carried out by the Nordic Council of Ministers is the branding of the Nordic region internationally. A new graphic profile and logo have been introduced to enhance visibility by means of a unified, visual representation for Nordic cooperation within the Nordic Council and the Nordic Council of Ministers, including organisations such as NordForsk. This new graphic profile is implemented in this year's edition of NordForsk Magazine.

The achievements made during NordForsk's first eleven years constitute a point of departure for further efforts to create added value in the form of better quality, cost-effectiveness and greater focus on societal development. NordForsk is working to realise the vision set out in its strategy for 2015–2018 of a "Nordic region that is globally leading in research and innovation, with NordForsk continuously contributing to this." In October 2016, NordForsk invited research councils, experts from Nordic collaborative groups and university representatives to a reference group meeting to discuss how to take Nordic research collaboration to the next level. The participants provided valuable input on NordForsk's



activities so far and proposals on the future direction of research and research infrastructure cooperation.

The first half of the meeting was used to present examples of areas in which preparations for jointly funded new initiatives are underway. These include pilot actions on Open Science, research on personalised medicine, migration and integration, education for tomorrow as well as development of e-Infrastructure. After this there were brief presentations of ideas for the future. Main questions here included how NordForsk as a facilitator can improve its role and what processes are needed to ensure that initiatives are aligned with national priorities. Other important topics included international cooperation, design of funding instruments, criteria for Nordic added value and Nordic relevance and benefit, as well as potential measures for ensuring that research results reach – and are applied by – policy-makers and other users in the private and public sphere.

Many interesting, and at times conflicting, suggestions were brought to the table. The participants were interested and eager to take part in the discussions. The result was an array of thought-provoking views on the future development of NordForsk. Now it is up to the NordForsk Board to review the contributions and decide how these should be reflected in action plans in the years to come.

*Gunnel Gustafsson, Professor
Director NordForsk*

POOR INTEGRATION MAY PUT THE WELFARE MODEL AT RISK

What are the consequences for the Nordic societies if they do not offer high-quality health and welfare services to refugees?

"The Nordic welfare model is based on equality and solidarity, and there is an impending risk of rising inequality and conflict in society if refugees receive inferior services," says Professor Allan Krasnik.



Professor Allan Krasnik.
Photo: NordForsk/Terje Heiestad

POOR INTEGRATION MAY PUT THE WELFARE MODEL AT RISK

Allan Krasnik is the director of the Danish Research Centre for Migration, Ethnicity and Health at the University of Copenhagen, as well as the project leader for Coming of Age in Exile (CAGE), one of the projects funded under NordForsk's Nordic Programme on Health and Welfare. Launched in 2015, the CAGE project is looking at issues relating to the health and welfare of refugees who come to the Nordic region – a highly relevant topic for all of the Nordic countries, both today and in the years to come.

"We have a theory that the integration of refugees into the Nordic societies, as well as their state of health and entry into working life, depend on the services they receive after they arrive. The CAGE project will perform comparative analyses across the Nordic countries to study the development of health and socio-economic inequities among refugees who have come to the Nordic region in recent decades," explains Professor Krasnik.

"Studies show that refugees find it difficult to get an education at the same level as the majority population in the country they come to and to achieve equal working conditions. Perhaps most importantly, many of them have health problems, especially mental health challenges that make daily life a struggle. We need to address this situation appropriately if we are to maintain today's societies as we know them," he says, and adds:

"Since this is the first time that a Nordic research project links together health, education and working life, we have a unique opportunity to shed light on the complex issues that this project addresses. It will be very interesting to look at the various practices used in the Nordic countries."

Registers and policy analyses will provide insight

The CAGE project will use a variety of methods to gain the best possible insight. First the researchers will focus on collecting data from the Nordic registers on refugees' state of health and level of education, as well as the employment measures in which the refugees participate. They will also perform policy analyses of the various solutions chosen and conduct qualitative case studies during the course of the project.

"Information from the registers enables us to compare refugee data from the entire Nordic region. This can be a challenge at the national level because many subgroups may be quite small, making it difficult to draw conclusions," says Krasnik.

"The difficulty is that it takes time to gain access to the registers. There are strict requirements relating to the transfer of data for individuals across national borders, and the countries have different practices for this as well. Fortunately, we have a good dialogue with the Nordic statistics bureaus, so I am confident that we will reach an agreement on the legal and ethical obstacles and find a solution that simplifies the process in the future. Then Nordic researchers will have access to information from all of the countries so they can perform analyses on data from the Nordic region as a whole, which is very logical since we have so much in common," he explains.

Claire Mock-Muñoz de Luna is a PhD fellow working on the CAGE project and helping to gather policy documents and perform the ongoing analyses of the solutions chosen in the Nordic region. "It will be interesting to view the situation in the context of the policy documents because the Nordic countries have similar

ABOUT THE NORDIC PROGRAMME ON HEALTH AND WELFARE

The Nordic Programme on Health and Welfare was launched in 2014 with the overall goal of improving health in the Nordic countries by finding solutions to societal and public health challenges through high-quality research.

The programme has an overall budget of nearly NOK 300 million and has issued four calls for proposals thus far. The fourth call, issued in summer 2016, was targeted towards projects utilising Nordic register data to answer research questions addressing grand societal challenges relating to health and welfare.

The Nordic Programme on Health and Welfare is a collaborative effort between the Academy of Finland, the Danish Council for Independent Research | Medical Sciences, the Icelandic Centre for Research (Rannís), the Research Council of Norway, the Swedish Research Council for Health, Working Life and Welfare (Forte), The Swedish Research Council and NordForsk.



Reception centre for refugees in Kirkenes, Norway. Photo: Cornelius Poppe/NTB scanpix

practices in many areas, especially in health and welfare, but have implemented widely divergent policies regarding refugees in general. We will also conduct qualitative case studies by means of interviews with refugees in Norway and Finland," says Ms Mock-Muñoz de Luna.

The Nordic region can provide Europe with answers

By employing a Nordic perspective, the CAGE researchers hope to generate important knowledge about how the Nordic countries can receive and take care of refugees in the best possible manner. "Since policy and practice are different, we can see what happens when countries that are very similar

to each other choose different refugee policies, and the different consequences this will in turn produce. The CAGE project can hopefully help to generate more knowledge about the effect of these different choices on the integration of refugees into the Nordic countries," explains Krasnik.

"The influx of refugees into Europe in recent years has led to a high demand for research in this area, and the rest of Europe is looking with great interest to the Nordic countries. Both the EU and WHO are interested in having more projects that study the issues we are investigating," he continues.

POOR INTEGRATION MAY PUT THE WELFARE MODEL AT RISK

Favourable towards Nordic cooperation

In addition to working with a highly relevant research project, both Professor Krasnik and Ms Mock-Muñoz de Luna are enthusiastic about working with their Nordic colleagues.

"There will always be differences when various research institutions are involved, but our experience so far in the CAGE project has been very good. I had worked with some of the researchers before, but now we have all gotten to know each other well, and our collaboration to date has been very beneficial. I would go so far as to say that I think of them as friends," says Ms Mock-Muñoz de Luna with a smile.

"The Nordic region has a common cultural and organisational background which means that we work in research in the same way and we often agree about the issues and parameters around us. In EU cooperation, on the other hand, it can take much more time to work through cultural differences and work methods. Many of them also have a different approach to deadlines and work plans than we have in the Nordic region," adds Krasnik.

Good health leads to better integration

The underlying assumption of the CAGE project is that poor health limits integration because people with health problems find it difficult to study, which in turn makes it challenging for them to gain a foothold in the labour market. At the same time, Krasnik thinks the dialogue in the Nordic countries on issues related to health and social challenges is not good enough.

"The CAGE project wants to learn how we can continue to provide high-quality welfare services to everyone,

including refugees, and it is critical that we are able to do this if we want the Nordic societies to develop harmoniously. For example, healthcare workers are asking for further education so they can get a better cultural understanding of and insight into diseases that are not as common in the Nordic region," he explains.

"But the Nordic dialogue on this issue is non-existent. There is a lot of discussion about border control and police cooperation, but health has not had a high profile in the Nordic debate. Hopefully our research will change this so that we can bring politicians and decision-makers with various perspectives into the discussion," Krasnik continues.

A contentious field characterised by prejudice

The increasing flow of refugees to the Nordic countries has aroused many strong feelings. Krasnik states that it is an important responsibility to study such a contentious field.

"The challenge is to analyse and shed light on the topic without stigmatising refugees, since there are many prejudices and stereotypes about this group. It is our task to bring nuance to these ideas and ensure that stakeholders in the field get the knowledge they need to act in a rational, effective manner," he says.

"Many decisions in recent years have been taken on the basis of prejudice, and health policy in particular has been misused in order to promote other policy objectives. For example, several Nordic countries have been reticent to maximise services for refugees to prevent their countries from being seen as an attractive destination. In this case, there is a risk that the quality of healthcare services provided to refugees already in the country will deteriorate because politicians are seeking to achieve something different. Therefore, it is important that our findings are conveyed clearly and unambiguously so that they are not misinterpreted or deliberately misunderstood by others," says Krasnik.

The wrong measures may have serious consequences

While it is hard to predict what the exact consequences for society will be if measures for refugees and migrants do not meet their mark, Krasnik is certain that they will be serious.

"If refugees continue to come to the Nordic countries, which we have to assume they will, the consequences will be serious if integration is not successful. It is critical that the Nordic countries identify which measures work

COMING OF AGE IN EXILE (CAGE)

Coming of Age in Exile (CAGE) is a research project funded under NordForsk's Nordic Programme on Health and Welfare.

The CAGE project performs comparative analyses across the Nordic countries to study the development of health and socio-economic inequities among refugees.

The project is headed by Professor Allan Krasnik of the University of Copenhagen. It was awarded NOK 30 million in 2015 and is expected to conclude in 2019.



PhD fellow Claire Mock-Muñoz de Luna and professor Allan Krasnik. Photo: NordForsk/Terje Heiestad

best and are most effective. If we do not manage this, it will lead to enormous economic and social problems for society, and we risk having a society in conflict with itself," says the professor before citing an example:

"Existing research shows that people who have experienced trauma after fleeing their homes are difficult to integrate into society. It is therefore important to quickly identify who this applies to when they arrive in the country and implement measures, but this seldom happens. It would be wise to have psychologists and healthcare workers available, but this is also a question of priorities. If we choose not to increase resources in this area, society will suffer in the long term. This means that we will see other, more serious problems, in addition to much higher costs, than if we provide good treatment at an early stage."

NordForsk gave life to the CAGE project

Professor Krasnik says that they could not have carried out the CAGE project without NordForsk's Nordic Programme on Health and Welfare.

"NordForsk's role has been critical. Without NordForsk, it would have been impossible to establish cooperation across national borders and thus gain access to

researchers who have the expertise we need to find answers to these complex questions," he says.

"At a time when refugees and migration were not in the headlines, NordForsk was already on board and understood the importance of the topic. Now it has become a high-priority issue in society, and thanks to NordForsk the Nordic region will have access to information that will be crucial in the coming years. I hope they will continue to play a leading role in this important research area," concludes Krasnik.

PARTNERS:

- Danish Research Centre for Migration, Ethnicity and Health, Copenhagen, Denmark
- Team CHES and University of Gothenburg, Sweden
- Institute of Migration, Turku, Finland
- Norwegian Centre for Violence and Traumatic Stress Studies, Oslo, Norway
- University College of Southeast Norway, Porsgrunn, Norway



MIGRATION IS THIS CENTURY'S MOST IMPORTANT ISSUE

Would it be of relevance for the Nordic countries to launch research cooperation relating to migration? In connection with a new Nordic cooperation programme on the integration of refugees and immigrants, the Nordic Council of Ministers has asked NordForsk to draw up an overview of existing knowledge in the area of migration and integration.

Tuomas Martikainen of Finland's Institute of Migration will head up the effort to compile a new report on Nordic migration and integration research.
Photo: NordForsk/Terje Heiestad



MIGRATION IS THIS CENTURY'S MOST IMPORTANT ISSUE

Basically, migration brings about a change in the population base," says Director Tuomas Martikainen, in response to the question of what type of challenge migration represents for the Nordic welfare states. "This relates to differences in educational, cultural and employment-related backgrounds, and it is something that the receiving society has to address. That being said, however, it is difficult to isolate a single overall question relating to migration. The challenges change as the migrant population changes."

Dr. Martikainen, Director of the Migration Institute of Finland, will be compiling the report on migration and integration research in the Nordic countries that NordForsk is preparing on behalf of the Nordic Council of Ministers. The report comes in the wake of the decision taken by the Nordic Ministers for Cooperation in April 2016 to launch a new Nordic cooperation programme on the integration of refugees and immigrants.

NORDIC OVERVIEW OF MIGRATION RESEARCH

The Nordic Ministers for Cooperation have commissioned NordForsk to compile an overview of existing knowledge as well as any Nordic policy recommendations in the area of migration and integration.

The report is being prepared by The Migration Institute of Finland, and will:

- view Nordic migration experience in a European and a global context;
- provide an overview of Nordic research infrastructure in the area, including information about research centres and national and Nordic research networks;
- present key review articles and their main conclusions, with a focus on the first decade of the new millennium and particular emphasis on comparative Nordic research;
- present the main directions of Nordic research in the 2010s with a focus on comparative Nordic research;
- identify gaps within Nordic research and research infrastructure, assess the added value of Nordic comparative studies and evaluate the need for a future NordForsk initiative in this area.

The report will present the current status of Nordic migration research based on a comprehensive review of existing literature and focus group interviews with key researchers in all the Nordic countries. But how can research help the Nordic countries to deal with the current influx of refugees and asylum seekers into the region?

"Research is generally best at telling us what not to do. Research is a systematic means of figuring out what is taking place, because that is actually not always entirely clear. This enables us to spot those things which will lead to undesirable outcomes for a large number of groups."

An exceptional natural experiment

From a research perspective, comparative studies of the Nordic countries are especially interesting. The latest wave of refugees and asylum seekers arriving in the Nordic countries comprises what Tuomas Martikainen calls an "exceptional, natural experiment". "We have a group of people with somewhat similar backgrounds who ended up in different countries with different asylum and integration policies. If we can get sufficiently good data from these, then we could actually see how different policies work in different contexts," he explains.

The comparative Nordic studies can be particularly interesting if migration research can draw on the Nordic registers to a greater extent. Research projects investigating the possibilities of linking register data to migration research are already underway, such as the NordForsk project Coming of Age in Exile (CAGE). However, this is an area with the potential for a wide range of innovative research activity.

"Registry sources are underutilised in migration research," Dr. Martikainen says. "There is quite a large number of Nordic citizens living in other Nordic countries. If we could combine data about the same individual in different countries, we would have an exceptional opportunity to address all kinds of research questions. A lot of these data will be essentially "nationalistic" to start with. But if you could actually track down the same individual across borders, it would provide unique possibilities in a global perspective."

Nordic differences and similarities

As part of the preparation for the report, NordForsk has appointed a working committee comprised of experts from the various Nordic countries to serve as a reference group. The committee has already held



The latest wave of refugees to Europe comprises what Tuomas Martikainen calls an "exceptional, natural experiment" for migration researchers. The photo shows refugees on the road in Denmark in autumn 2015.
Photo: Michael Drost-Hansen/Polfoto

its first discussions on what Nordic cooperation on migration should involve.

"During our first meeting the relative similarity of the Nordic welfare states emerged again and again. Our general approaches are much the same. Then again, there are some historical and contemporary differences between our migration policies, which, from a researcher's perspective, make it very interesting to carry out comparative studies," Tuomas Martikainen says. "Another challenge within the field is that we need good interdisciplinary cooperation in order to study different problems. When we look at the different Nordic countries, we can see that there are differences regarding how people with different academic backgrounds work together."

Differences such as these are among the issues to be identified in the overview of existing knowledge. There are many ways in which the Nordic countries can learn from one another.

Migration of decisive importance

"It is always the case that when researchers meet, they think that what we need is more research, especially

within their own field," states Martikainen with a smile. "Nevertheless, migration is not a marginal topic. Human mobility in one form or another may be of decisive importance in this century. According to the UN, the world population will continue to grow until the end of this century, and if you combine that with climate change and political upheaval, it is quite clear that we will only see an increase in mobility."

"Think about Syria," he continues. "Before the Arab Spring it was considered to be one of the more stable, well-functioning, middle income countries with a well-educated population and a relatively good infrastructure. Now, five to six years later, large parts of the country are in chaos, leading to the relocation of several million people."

"The lesson to be learned from the refugee flow of last winter is that under certain circumstances migration can take place very rapidly. What we can do is to be ready for these changes, because that may help us deal better with the increasingly complex question of human mobility," Martikainen concludes.

THE NORDIC REGION IN TRANSITION

In 2017 Norway will be assuming the Presidency of the Nordic Council of Ministers. Norway's Minister of Nordic Cooperation, Elisabeth Vik Aspaker, hopes to further develop a Nordic policy and cooperation framework that will identify the research areas that can help the Nordic region to advance.





ELISABETH VIK ASPAKER

Elisabeth Vik Aspaaker has been a Minister of Nordic Cooperation since 2013 and, since 2015, Minister of EEA and EU Affairs for Norway. She was previously Minister of Fisheries and has been a Member of the Storting (Norwegian parliament) representing the Conservative Party of Norway since 2005.

THE NORDIC REGION IN TRANSITION

The Government's political platform clearly emphasises the importance of Nordic cooperation, both in and of itself and because working together gives us a stronger voice in the European community," states Elisabeth Vik Aspaker.

Research a vital component of the programme

The Norwegian Programme for the Presidency has three main focus areas: the Nordic region in transition, the Nordic region in Europe and the Nordic region in the world at large, and all of these have research as one of their components.

"No matter how you look at it, research will be important in all these contexts. The Nordic region is facing major challenges in connection with restructuring. We need to add new and more strings to our bows. We need smarter thinking to deal with emerging demographic trends and we must cope with future climate and energy challenges. Research is pivotal in all these areas," she says, adding:

"Nordic research and research cooperation is an important supplement not only to national efforts, but also to major European research programmes such as Horizon 2020. Therefore, I believe that the only way to come up with effective solutions to the challenges we face is to learn from one another, share our insights and develop new knowledge."

Seeking close cooperation on EU's legislation

Ms Vik Aspaker points out that Norway has strong interest in producing high-quality research, both by building on ongoing Nordic research projects and by establishing closer cooperation in other research areas.

"One area in particular we should be looking into is the new EU directive on the protection of personal data. What do we need to do to safeguard personal privacy and at the same time make data accessible for research in a secure manner, thus promoting further development of Nordic society? If we work together closely on how to implement this new legislation as similarly as possible it will be much easier to share registry data across our national borders," states Norway's Minister of Nordic Cooperation.

"If the five countries employ different frameworks for implementing this legislation," she goes on to explain, "it may have a negative impact on research in the long term because it will impose legal and ethical barriers relating to research and personal privacy that will be difficult to surmount. We must not compromise on the rules that currently govern these activities, but it is important to seek modernisation and, thus, to make it easier to carry out research projects that benefit society using data from the Nordic countries. This is an important area for Norway."

Positive towards the Open Access pilot

NordForsk's report Open Access to Research Data – Status, Issues and Outlook recommends a project in which NordForsk funds a pilot programme for research activities that incorporate Open Access from start to finish.

"Open Access to research data is an important, priority area for Norway and this pilot is in line with one of the main focus areas of the Norwegian Programme for the Presidency: the Nordic region in transition. We hope that NordForsk's pilot project is launched in 2017 and we look forward to following its progress," Ms Vik Aspaker says.

ABOUT THE PRESIDENCY OF THE NORDIC COUNCIL OF MINISTERS:

The Presidency of the Nordic Council of Ministers rotates between the five Nordic countries and is held for a period of one year. The country which holds the Presidency actively leads the work in the areas of cooperation.

To support this, a Programme for the Presidency is drawn up in which the political priorities for Nordic inter-governmental cooperation during the year to come is presented. The Programme is presented by the prime minister of the next country to hold the Presidency at the Nordic Council's annual meeting. The institutions and the bodies for cooperation are important instruments in carrying out the Programme.

The country which holds the Presidency in the Nordic Council of Ministers also holds the chair for the Nordic Prime Ministers' meetings throughout the year. The same applies for the meetings of the foreign ministers and the ministers of defence which always take place outside of the formal Nordic cooperation.



Norway's Minister of Nordic Cooperation
Elisabeth Vik Aspaker
Photo: NordForsk/Terje Heiestad

The Nordic region in Europe and worldwide

Ms Vik Aspaker points out that in a time of constant change and a growing need for new solutions in Europe and worldwide, many countries are looking to Nordic countries for inspiration.

"We see that the Nordic countries have done a lot right in developing their societies. When I was in Paris recently, the European Commission hosted a seminar on what the French public sector could learn from the Nordic countries. The focus was on health, education and digitisation of public administration. This is an excellent example of the high level of interest being shown in the Nordic region."

"I hope that the Nordic countries can help to solve the major challenges facing Europe, such as migration, integration and the green transition. In particular, I am thinking about follow-up activities to the Paris Agreement where Nordic countries have taken on considerable responsibilities. The energy supply solutions we have in the Nordic region are largely based on green production methods. The EU will also look to the well-functioning energy market and first-rate solutions we have achieved as it works to design its Energy Union," she says.

In closing, the minister emphasises that further development of the Nordic countries is dependent on aggressive research policies.

"What we produced yesterday, and the way we produced things yesterday, may not be the way to do it in the future; research is therefore a driving force behind activities to generate and facilitate restructuring."

The minister also believes it is important to conduct a close Nordic research-policy dialogue and to show an active interest in what the neighbouring countries are doing.

"I hope that the dialogue between NordForsk and the Nordic research councils is beneficial and that it helps to facilitate research cooperation in areas of strength for the Nordic region, where we can develop strategically important spheres of cooperation. This will enable us to build a bridge to Horizon 2020 and consequently to the rest of the European research community."



Antti Pursula, project manager
of the Tryggve project.
Photo: NordForsk/Terje Heiestad

TRYGGVE TAKES CARE OF SENSITIVE DATA

Researchers seeking to share biomedical data between Nordic countries face both technical and legal hurdles. The joint Nordic project Tryggve offers services that address these challenges by allowing researchers to process and share data securely across national borders – without transferring sensitive data via poorly protected means such as USB drives or personal laptop computers.

"The challenge we are working on is how to make the vast amount of data on health and well-being available to researchers in a good way," explains Antti Pursula of the CSC – IT Center for Science in Finland and project leader of the Tryggve project. "Health and registry data are very valuable for research, and great advances are

being made in genetics and medical research thanks to this kind of data. At the same time, in legal terms this type of data falls into a category of sensitive personal data requiring that proper security measures are taken to protect the privacy of the participating individuals, such as making sure that all use of these data is authorised."

Health data used for research purposes are typically anonymised by removing personal details such as names and personal identity numbers and using registry numbers instead. Nevertheless, the data involved may be so detailed that they still can reveal which individual is hidden behind a specific registry number.

"In a typical use case, there is a hospital study collecting data from volunteer subjects," continues Mr Pursula. "There are DNA sequences, some basic information on the volunteers such as lifestyle, diet or exercise habits, as well as whether or not they have been diagnosed with a specific condition. This is so much information that in some cases it may actually be possible to deduce the identity of specific persons. This shows why it is important to protect these data properly when used in research."

THE TRYGGVE PROJECT

The objective of Tryggve is:

- to establish highly secure IT-based services and infrastructure to enable researchers to share and use sensitive data across national borders
- to develop solutions that can be deployed to facilitate collaborative research on sensitive data also in Europe and beyond.

Tryggve is a collaborative effort between Denmark, Finland, Norway and Sweden. It is funded by the Nordic e-Infrastructure Collaboration (NeIC) and the ELIXIR centres in the participating countries. ELIXIR is a European research infrastructure for life science information.

Project development with user involvement

A key component of the Tryggve project is that the IT services are being developed through what the project calls "use cases", i.e. concrete cases where researchers bring the projects they need assistance with. If the scientists feel their research could benefit from Tryggve's services, they can make a request via a simple online form. There are few requirements imposed: a study must involve multiple Nordic countries and sensitive data.

If the Tryggve experts find that the requesting study fulfils the requirements, they start a more in-depth dialogue in which researchers and Tryggve team members figure out what is needed.

TRYGGVE TAKES CARE OF SENSITIVE DATA

"Up to now we have been in a pilot phase to develop the services," says Mr Pursula, "but now, halfway through the project, we are far enough along that it is more a matter of testing the services in real-life situations and supporting the users. Each use case has different needs and we try to accommodate them, which requires fine-tuning and additional development. But otherwise it is actually the administrative and legal aspects that are taking up more time now."

Legal advice essential

If a researcher wishes to combine multiple data sets and if the work extends across national borders, it gives rise to challenges that are not only technical.

"Sometimes different countries' laws governing usage can be different, but there are also different regulations and practices," says Mr Pursula. "This is a problem that is also found at the European and global levels."

To help researchers to navigate laws and regulations, the Tryggve project has enlisted a lawyer who has reviewed the specific provisions and consent requirements regulating the individual data sets of a use case. This service is available for new cases as well. Overall there is strong emphasis on fulfilling the laws and regulations, as this is essential for being a trusted partner for Nordic data organisations and researchers.

"We have actually been somewhat surprised by the complexity of provisions governing data sets," says Mr Pursula. "There are laws at both the European and the national levels as well as laws in various areas we need to follow. Things such as the right to privacy, the use of health data for research purposes and so on are regulated in different ways. A further complicating factor is that local authorities at times appear to be applying guidelines that are more stringent than the law requires."

No accidental copies

The Tryggve project offers a secure means of transferring data between countries in which the transfer itself is encrypted and no temporary copies are generated underway. Most users gain access to the secure data environments by logging in to a remote desktop, similar to logging in to do online banking, and via this system, users get access to a range of scientific software and reference datasets.

This gives collaborating researchers access to a shared computer where they can store and analyse their data. Access is only granted to one's own data, and only the person who is legally responsible for the research project can delegate permission to take data out from the system. Thus you can easily get data into the system, but the system ensures that you cannot copy-paste data out of the system by mistake. The only thing Tryggve cannot protect you from is someone taking a photograph of your computer screen.

"By and large, researchers are careful with their data," Mr Pursula believes. "Today people know not to send data sets by email, but it can still be problematic to store data on personal laptops or USB drives and upload them to shared computers, where temporary copies might be generated. We offer a secure and easy-to-use alternative to all that."

Entire Nordic region as a statistical base

The goal is for Nordic researchers to be able to transfer data, even sensitive data, across national borders via secure infrastructure that is readily accessible to researchers. Realising this requires cooperation and trust between countries.

"Slightly exaggerated, we can say that everyone supports the cross-border sharing of data, as long as everyone else is just sending data to their country. But it takes a lot of discussion to agree on common goals, even among the Nordic countries, and that has surprised me a bit," says Mr Pursula.

"Still, I think that in the Nordic countries we are more inclined to cooperate. Researchers in particular understand perfectly well that five or ten million people is sometimes not a large enough pool for carrying out population-based studies, such as in cases of a rare disease. Using the entire Nordic region offers a population base of 26 million people."



GENETICS AND ENVIRONMENT ACROSS BORDERS

Professor Patrick Sullivan of Karolinska Institutet uses the Tryggve project's secure IT-based system in his research on schizophrenia. Photo: Ulf Sirborn

What are the roles played by environmental and genetic factors in the development of schizophrenia? This question is being examined by an interdisciplinary team of researchers using case and control groups in five different countries. The Tryggve project's secure IT-based system has been vital in enabling researchers to share data across borders.

"We've known for a long time that it's both genes and environment," states Professor Patrick Sullivan from the Karolinska Institutet. He is heading a major interdisciplinary research project which combines genetic and environmental data to help researchers to gain a better understanding of how schizophrenia develops.

"The problem is that there are very few places in the world where you can get good environmental measures," Dr Sullivan says, adding, "The Nordic countries are one of those places, as data have been collected in a careful and rigorous way over a long time."

So far, no single research group has had access to a test group large enough to investigate this thoroughly.

This would require cross-border cooperation, which is difficult because the various countries have different rules and regulations in place concerning the use of sensitive data.

Cooperation yields a larger test group

"For a long time, we've wanted to work together and do registry-based research," Dr Sullivan explains, "but it has been difficult in the absence of a secure framework that is acceptable for the regulators in each country and ethical review committees. The great thing about the Tryggve project has been that it has allowed us to do that in a way that we never really could before."

Using the Tryggve project's secure data-sharing systems, researchers have succeeded in putting together a test group comprising 6 000 patients and a control group of 8 750 individuals. At the same time, they have received helpful advice concerning the legal aspects of data sharing.

"One of the great things about the Tryggve project is that we have had an expert helping us to figure out what the relevant laws are – what is doable and what is not doable. They've been fantastic," says Dr Sullivan, who is enthusiastic about the collaboration with the Tryggve project team. "They've been responsive, professional and extremely helpful in allowing us to use resources that were critical to carrying out this project."

RESPONSIBLE DEVELOPMENT OF THE ARCTIC

The Research Programme “Responsible Development of the Arctic – Opportunities and Challenges – Pathways to Action” was launched to expand knowledge about opportunities for and challenges facing the region. In December 2015 NordForsk decided to establish four new interdisciplinary Nordic Centres of Excellence under the programme. The programme’s overall budget is approximately NOK 116 million, with funding from NordForsk, the Swedish Research Council, the Nordic Council of Ministers, the Research Council of Norway, the Academy of Finland, Denmark’s Ministry of Higher Education and Science, and the Icelandic Centre for Research – RANNIS.





RESPONSIBLE DEVELOPMENT OF THE ARCTIC



Photo: NordForsk/Terje Heiestad

Professor Birgitta Evengård
Umeå University

NCoE CLINF: Will be investigating how climate change in the Arctic can give rise to new medical and social health issues and how to meet challenges to come in the best possible way.

"The basis for our work at NCoE CLINF is that climate changes in the Arctic are altering the spread of plant and animal life all over the world, because plants and animals are changing along with the climate. This means that ecosystems are changing too, and in the Arctic this is happening three times faster than anywhere else," explains Birgitta Evengård, professor and chief physician at the Department of Clinical Microbiology at Umeå University.

NCoE CLINF has three project leaders: Birgitta Evengård of Umeå University, Ann Albiñ of the National Veterinary Institute (Sweden), and Tomas Thierfelder of the Swedish University of Agricultural Sciences.

The Nordic Centre of Excellence CLINF (Climate-change effects on the epidemiology of Infectious diseases and the associated impacts on northern societies) involves approximately 50 researchers from eight different countries.



Photo: NordForsk/Terje Heiestad

Professor Øystein Holand
Norwegian University of Life Sciences

NCoE ReiGN: Reindeer husbandry is affected by climate change and globalisation, as well as by a number of other regional factors such as the construction of cottages, mining operations, other grazing animals and various political decisions.

"The overall objective of NCoE ReiGN (Reindeer Husbandry in a Globalizing North – Resilience, Adaptations and Pathways for Actions) is to gain insight into how climate change and other processes in the Arctic will affect reindeer husbandry in Finland, Sweden and Norway. The centre will also examine ways in which reindeer husbandry can adapt to the changes taking place," explains project leader Øystein Holand, professor in Animal and Aquacultural Sciences at the Norwegian University of Life Sciences.

NCoE ReiGN is an interdisciplinary cooperation between 11 Nordic research institutions and encompasses a wide range of subject areas, from genetics and evolutionary theory to ecology, resource management and legislation.



Photo: NordForsk/Terje Heiestad

Research Director Yongqi Gao
The Nansen Environmental and Remote Sensing Center

NCoE ARCPATH: The rapid rise in temperature in the Arctic poses new challenges for northern communities already under pressure. The decline in sea ice has resulted in more shipping activity which, combined with oil and gas exploration, may have an impact on both fisheries and marine mammals.

"Activities at NCoE ARCPATH (Arctic Climate Predictions: Pathways to Resilient, Sustainable Societies) will focus on socio-economic changes in specific coastal communities on Iceland, Greenland and in Northern Norway and incorporates both natural science and social science perspectives. Our objective is to combine improved regional climate prognoses with a deeper understanding of interactions between environmental, social and economic factors within these communities in order to generate new knowledge and approaches to ensure responsible development in the Arctic," explains project leader Yongqi Gao, Research Director at the Nansen Environmental and Remote Sensing Center (NERSC) in Bergen.

NCoE ARCPATH involves 11 research institutions in Norway, Denmark, Sweden, Iceland, China, the US, Russia and Canada.



Photo: NordForsk/Terje Heiestad

Professor Sverker Sörlin
KTH Royal Institute of Technology

NCoE REXSAC: The extraction of natural resources in the Arctic has a long history and has had a profound influence on societal development as well as the environment. Professor Sverker Sörlin of KTH Royal Institute of Technology in Stockholm is heading NCoE REXSAC (Resource Extraction and Sustainable Arctic Communities), which will be studying oil and gas activity and, in particular, mining operations in the north.

"The lower price of oil has reduced interest in new oil and gas activity in the north. Mining operations are also less extensive than they were a few years ago. But there are always plans on the table for new activity and we will look at how natural resources can be extracted in a sustainable manner," Professor Sörlin explains.

"It is often hard to decide what will be most beneficial for the development of a community and it is not a given that all resources should be extracted. This kind of problem emerges, for example, when new mining operations conflict with reindeer husbandry needs. These are difficult questions which we would like to examine more closely in order to redefine our positions and target thinking towards the future. Our ambition is to generate research findings that benefit the population in the region," says Sörlin.

Professor Sörlin is in charge of the NCoE, which involves the participation of approximately 75 researchers from 15 research institutions in Nordic countries as well as Canada and Russia.

INFECTIOUS DISEASE IN THE ARCTIC: **ANTHRAX OUTBREAK IN SIBERIA JUST THE BEGINNING**

In summer 2016, media reported an anthrax outbreak in Siberia and this came as a shock to many, since the illness has not been active there for over 60 years. But Professor Birgitta Evengård and her colleagues at a new interdisciplinary Nordic research centre were not surprised. "This is just the beginning," she said.

Anthrax has not been reported in Russia since World War II, but in August 2016 a 12-year-old boy died of the dangerous disease, and over 90 persons were infected. A heatwave with temperatures of up to 34 °C swept across the Yamal Peninsula in Northwest Russia, melting the top layer of permafrost and exposing the remains of frozen reindeer containing anthrax spores. The spores were then spread via reindeer flocks grazing in the area.

"We have tried to look into the future to predict the impact of climate change on the Arctic. The anthrax scenario was not difficult to envision, and that is precisely why we have gotten involved," explains Professor Birgitta Evengård.

Permafrost is a Pandora's jar

Evengård is Professor of Infectious Diseases at Umeå University in Sweden. She has been studying health-related impacts of climate change in the Arctic for many years and is one of the three co-heads of the recently launched Nordic Centre of Excellence on Climate-change Effects on the Epidemiology of Infectious Diseases and the Impacts on Northern Societies (NCoE CLINF), funded under NordForsk. Approximately 50 researchers from eight different countries will be investigating both how climate change in the Arctic can give rise to new medical and social health issues and how to meet challenges to come in the best possible way.

When the US radio broadcasting company National Public Radio (NPR) called Evengård to ask about the anthrax outbreak in Siberia, she compared the

permafrost in the Arctic to Pandora's jar from Greek mythology. Pandora's jar contained disease and all the evils of the world, which were released when Pandora opened the lid out of curiosity. The researchers of NCoE CLINF are also curious, but they are trying to find out how to do the opposite and put the lid back on disease.

Flora and fauna are on the march

"The basis for our work at NCoE CLINF is that climate changes in the Arctic are altering the spread of plant and animal life all over the world, because plants and animals are changing along with the climate. This means that ecosystems are changing too, and in the Arctic this is happening three times faster than anywhere else," Evengård explains.

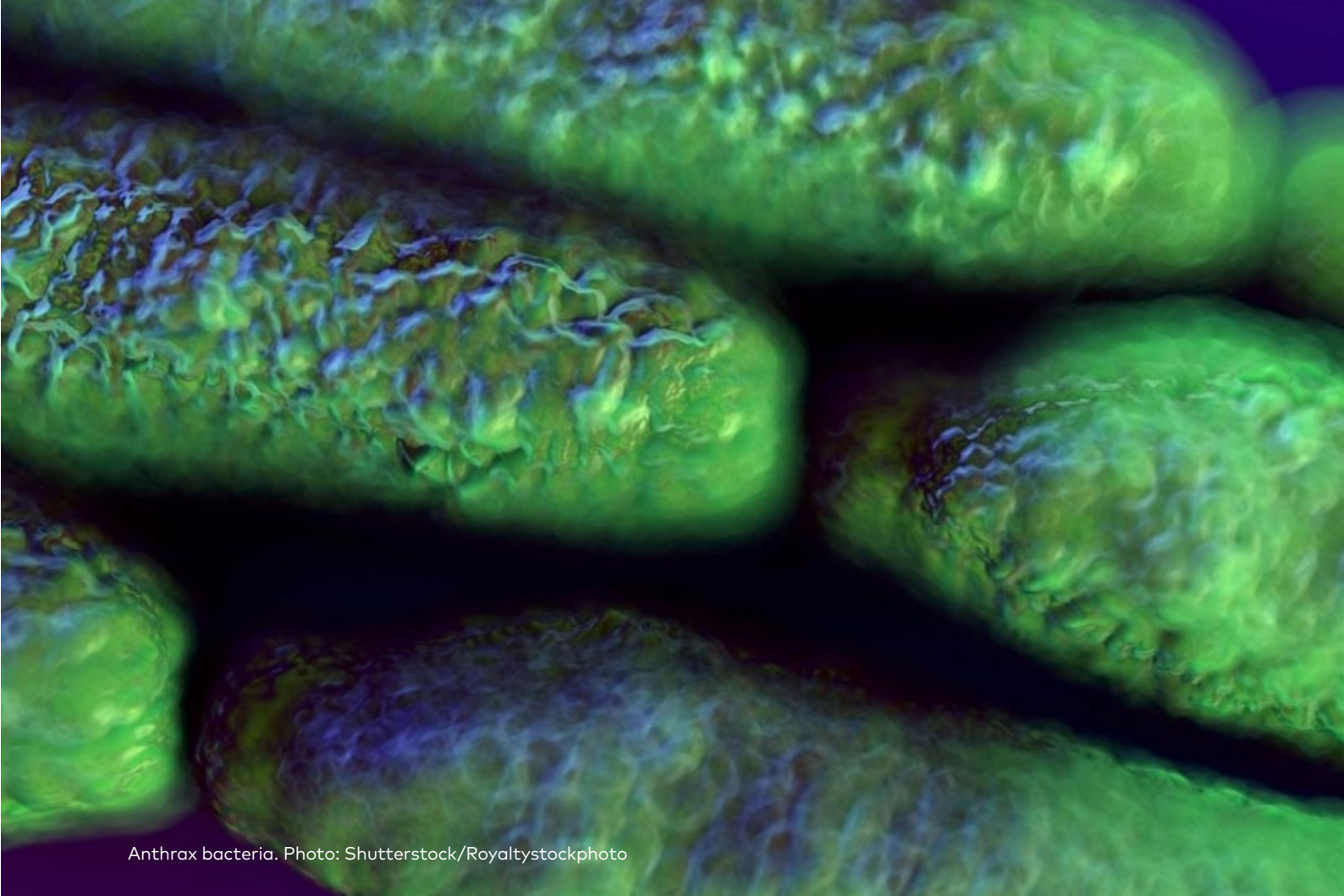
Changing ecosystems also mean that conditions for the spread of infectious disease will change. Ticks carrying dangerous viruses can live farther north, respiratory diseases and allergies can become more widespread due to changes in plant cover, and reduced access to clean water and safe food will be more of a problem. Polluted food and water lead to a rise in infectious diseases among the population. Treating these requires treatment with antibiotics – and overuse of these antibiotics leads to resistant bacteria.

"The people who are most vulnerable are those living in the closest contact with nature, i.e. the indigenous population. The Nordic region only has one indigenous group, the Sami people, but Russia is home to some 40 indigenous groups who speak a variety of languages. Many of them are highly dependent on their natural surroundings for their livelihood. On the Yamal Peninsula it was the Nenets, who primarily make their living from reindeer husbandry and hunting, who were hardest hit by the anthrax outbreak," she continues.

Out to get the facts

Over the next five years, NCoE CLINF researchers will monitor developments in the Arctic, first and foremost to compile information that will give politicians a solid basis for decision-making.

"Among other things, we want to establish structured monitoring activities that involve civil societies in the



Anthrax bacteria. Photo: Shutterstock/Royaltystockphoto

north. This can facilitate detection of new outbreaks of disease at an early stage, which then makes it possible to limit further spread. We believe this research will generate new knowledge that will be valuable in other parts of the world as well," Birgitta Evengård states.

NCoE CLINF's leadership group is currently deciding which infectious diseases to focus on. It is highly likely that the researchers will concentrate particularly on zoonoses, or diseases that are naturally transmitted between animals and humans. In addition to physical health, the centre's activities will encompass social health problems.

Open Science can save lives and prevent health problems

Throughout a long career, Professor Evengård and the other researchers have been accustomed to keeping their data to themselves, but this is now changing. NordForsk has introduced a policy of open access to scientific articles and is promoting Open Science, which entails that data, software and the like are also freely shared. The researchers of NCoE CLINF are fully in favour of this.

"We will be producing data that other researchers and the public at large can also access. Open Access and Open Science mean better use of society's resources and embrace an important democratic perspective. This may be even more important for the kind of research we

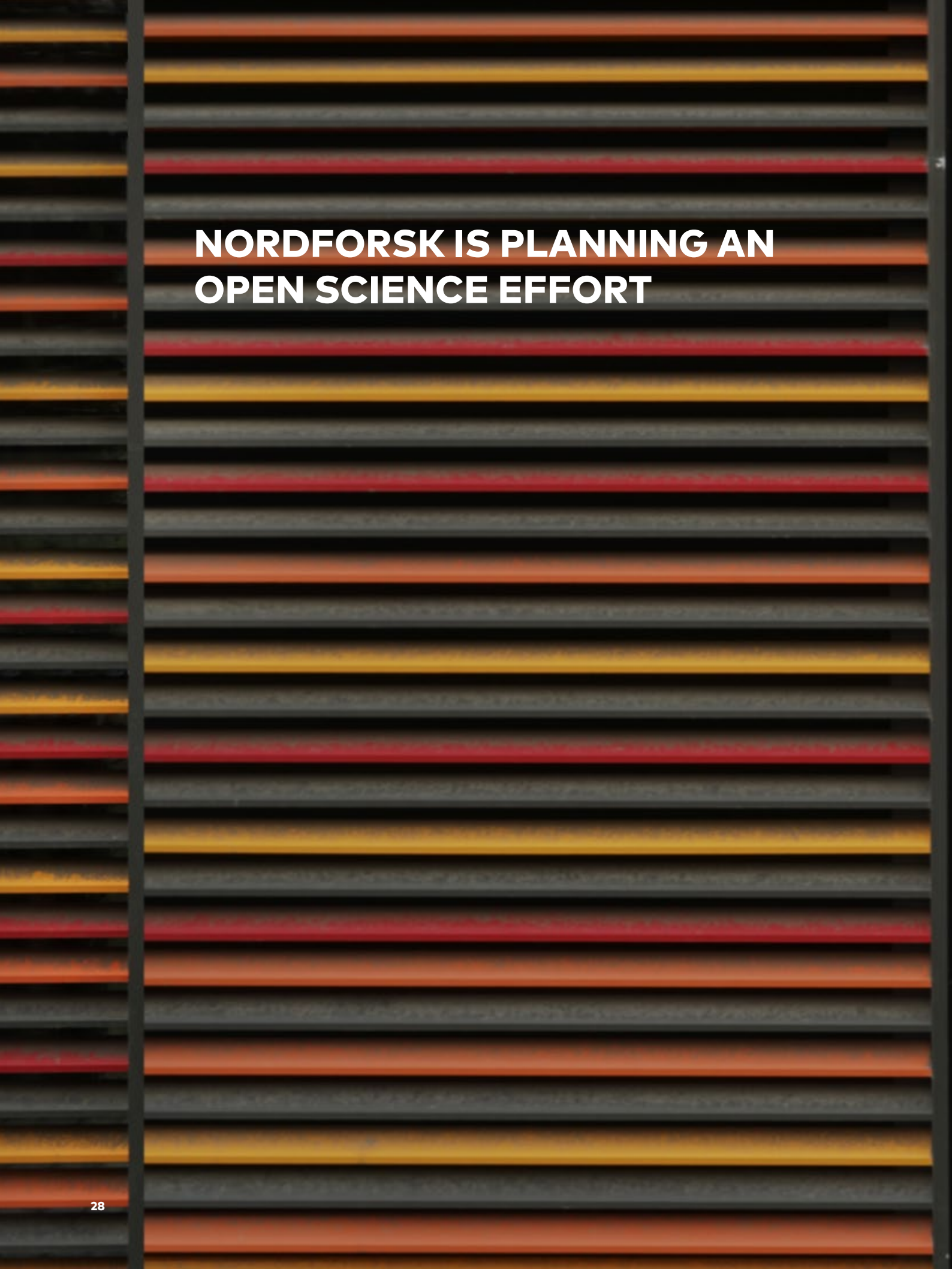
are working on. It is critical that new knowledge reaches politicians and decision-makers as quickly as possible, instead of researchers hanging on to their own data for themselves. Open Science can save lives and protect health," Evengård says.

Praise for NordForsk

Professor Evengård is particularly pleased that NordForsk has prioritised close cooperation with Russian researchers.

"Half of the Arctic is located in Russia, and the world's largest tundra is in Siberia. It is essential to know more about the impact of the melting of the Russian tundra currently taking place. Russia has both outstanding universities and highly-skilled researchers that will make important contributions to this research," Professor Evengård says.

"Finally, I wish to commend NordForsk for understanding that climate change in the Arctic will lead to many major problems. It is admirable that NordForsk had sufficient foresight to establish an Arctic programme long before the anthrax outbreak on the Yamal Peninsula, which was a wakeup call for many others," Evengård added.



NORDFORSK IS PLANNING AN OPEN SCIENCE EFFORT

A portrait of Sverker Holmgren, a man with light brown hair and glasses, smiling. He is wearing a grey blazer over a blue and white striped shirt and blue jeans. He is standing in front of a wall with horizontal stripes in red, orange, and yellow. His hands are in his pockets. A small blue logo is visible on the left lapel of his blazer.

Sverker Holmgren is a professor of Scientific Computing at Uppsala University and the programme director of NordForsk's Nordic eScience Globalisation Initiative. Photo: NordForsk/Terje Heiestad

NORDFORSK IS PLANNING AN OPEN SCIENCE EFFORT

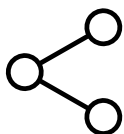
NordForsk will soon launch a research effort that incorporates Open Science principles into all phases of research: from planning the project and issuing the call for proposals to project implementation and publication of results.

A groundbreaking initiative

Sverker Holmgren headed a NordForsk project group which was commissioned by the Nordic Council of Ministers to prepare a status and perspective report on open access to research data. Presented to NordForsk in March 2016, the report has been well received by the various groups and will be followed up with several specific, future-oriented measures.

"The NordForsk board reviewed the report and forwarded it to the national research councils, which are key interest groups for NordForsk. The report was then discussed at the NordForsk board meeting in June, and the board decided to take two important actions. There is widespread agreement to develop both Open Access and Open Science in the Nordic countries," says Dr Holmgren.

In one of the actions, NordForsk will continue the series of conferences and workshops that have been organised since 2013. The primary objective of these events is to encourage an exchange of knowledge and information between the research-funding institutions in the Nordic countries as well as other actors.



OPEN ACCESS AND OPEN SCIENCE

- **Open Access** usually refers to free, online access to research publications. This means either that research results are published in journals that give free usage rights to everyone or that research papers are uploaded and made available in open publication repositories at the institutions or in central archives such as PubMed.
- **Open Science** is a broader concept which entails that e.g. collected data, methods, software and educational resources will be made freely available to the public as well.

A pioneering measure

"The second and perhaps most innovative action is that the NordForsk board gave its support to establish a research effort that incorporates Open Science principles in all phases from the planning of the call to the final evaluation of the funded projects. In other words, the pilot programme will go further than just implementing open access to research data and scholarly publications," explains Dr Holmgren.

Open Science implies that much more than the publications will be made publicly available. Data, methods, software and educational material will be available as well.

"As far as I know, such an all-encompassing research effort based on Open Science has never been implemented in the Nordic region. Even in an international context, this is a pioneering initiative," says Dr Holmgren.

The research councils must participate

"The research area that the effort will target has not been decided yet, but the NordForsk board naturally wants to focus on an area in which Nordic cooperation can generate added value. It is also critical that the national research councils take part in designing both the effort and the funding announcement. NordForsk wants the programme to serve as a platform for communication on Open Science," says Dr Holmgren.

"It is relatively easy, at least in principle, to implement open access to scholarly publications: This has been possible for the past 500 to 600 years. But there are no established systems or mechanisms for how to publish research data and implement Open Science principles, so we will need to break a great deal of new ground in this area," says Dr Holmgren.

Higher quality research

Professor Holmgren envisions huge benefits from implementing Open Science.

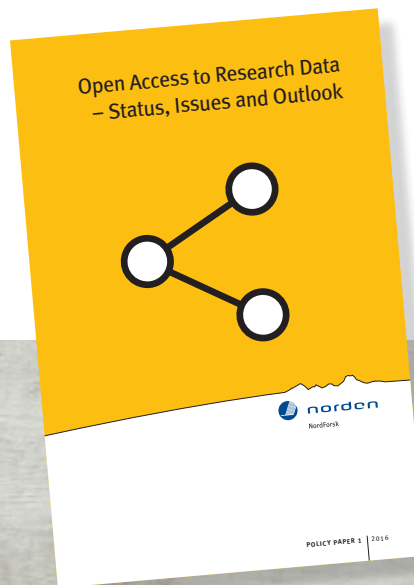
"The Open Science principles will make research more effective, transparent and reproducible. In short, we are laying the foundation for research of higher quality. Another result is that this will improve the interplay among researchers and between the researchers and society at large, which may give research results a greater impact. Moreover, it is an important principle for research results produced with public funding to be publicly available to the greatest extent possible," says Dr Holmgren.

Dr Holmgren adds that both Open Science and Open Access to research data must be implemented pragmatically.

"For instance, it will never be possible to publish all of the data collected in all research projects. Some data must be withheld out of consideration for personal privacy, contract terms, competitiveness of private companies participating in the research and the like," he points out.

"There is also reason to expect many researchers to be sceptical about publishing the data they have collected, which they might view partly as their own property. For example, they may not have completed their data analysis, and they may have less confidence in data collected by other researchers. Nor is there any tradition

for publishing data or a system of rewards. NordForsk will therefore seek to design a research effort using Open Science principles that truly document the added value this can generate for the researchers as well as for society at large," says Dr Holmgren.



The report *Open Access to Research Data – Status, Issues and Outlook* has already had a major impact.

Professor and Programme Director Sverker Holmgren. Photo: NordForsk/Terje Heiestad



WE ARE FACING A SMALL REVOLUTION IN SCIENCE

"Previously, we had a very narrow view about the impact of research, as it was mainly assessed by the number of publications in high quality journals. But the real impact should be assessed on a much broader and societal scale", says Sander Dekker, State Secretary for Education, Culture and Science of the Netherlands.

One of the perks of holding the rotating presidency of the European Union is that it gives a member state a 6-month megaphone to promote its favourite policy ideas. The Dutch Presidency from January 1 to June 30 2016 made Open Access to research publications a key priority, and State Secretary Sander Dekker was the primary spokesman for the initiative. In this interview with NordForsk Magazine, Mr Dekker explains the motives behind pushing for more widespread use of Open Access as a means of publishing the results of publically-funded research.

Open Access is a benefit to our societies

"There are basically two reasons for putting Open Access high on our agenda, and one of them has to do with a modern perspective on how future markets are going to work. The European Union is based on the internal market and free movement of capital, people and goods. But nowadays, our economies are more and more driven by knowledge and data. A lot of this knowledge and data is of course created at our publicly funded universities, but the results of this work are often hidden behind paywalls erected by privately owned academic publishing houses. I think that if we want to benefit more from the work of our researchers, and cause a free circulation of knowledge and data, we need to have new guiding principles where the work of our researchers is open and directly accessible for everyone", says Dekker. He continues:

"This will benefit our teachers who need scientific results to improve their lessons, our doctors and general practitioners who should include new ways of thinking and the latest knowledge in their treatments, our entrepreneurs who are always looking for new innovations, and so on. I firmly believe that Open Access can have a large societal impact by giving an enormous boost in innovation and stimulate the economy. This was the main driver behind putting Open Access high on the agenda", explains Dekker.

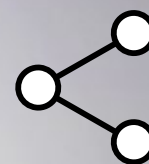
Open Access as a moral obligation

Mr. Dekker explains that the other motivation behind the push for Open Access is more a question of principle:

"We have a moral obligation to make sure that the work that has been done with taxpayers' money, with public funding, also is accessible to the same public. Open Access and Open Science can contribute to a more dynamic economy, to more growth and sustainable jobs. Therefore, we should let the public see more of the results from the good work that is being done in the scientific community".

Sander Dekker was very happy when the European Union's Competitive Council, a gathering of the 28 ministers of science, innovation, trade and industry, came to an important agreement during their two-day meeting in Brussels at the end of May 2016. The ministers agreed that Open Access should be implemented on a broad scale in all EU funded research by 2020.

"This commitment is a major support for our research universities, who have been asking for political backing in their negotiations with the publishers. Our experience from the Netherlands shows that political support to universities will produce results. In the Netherlands, our universities had political backing when they went through very tough negotiations with publishers like Springer and Elsevier, and the result is that the academic publishing houses have now made changes in their business models. They are opening up and starting to adhere to the principles of Open Science", explains Mr. Dekker.



"We are now facing a small revolution in the scientific community", says Sander Dekker about Open Access. He is the State Secretary for Education, Culture and Science of the Netherlands. Photo: Government of the Netherlands.

Happy about the competition

The Netherlands is often considered a European pioneer in Open Access, but Mr. Dekker is only happy to observe that Nordic countries are joining the competition.

"It is good to learn that NordForsk is planning a Nordic Pilot programme on Open Science, and that the Nordic countries want to compete about being among the most progressive partners in this perspective. This can be a good example also for other countries", he says, and adds:

"We are now facing a small revolution in the scientific community. Previously, we had a very narrow view about the impact of research, because impact was mainly assessed by the number of publications in journals like Nature and Science. Publishing will of course always be an important element of good scholarly work. But if we want to assess the full societal and economic impact of the work performed by our scientists, we should look at a much broader impact. We should assess the boost in innovation and the economic impact, which has the potential to be enormous", says Dekker.

Planning a conference in 2018

The Dutch presidency of the EU has ended, but Mr. Dekker promises that Open Access and the broader concept of Open Science is going to remain high on the Dutch agenda. He has already started planning an international conference in 2018 and is also going to take several other initiatives.

"We will continue our work to move this topic forward, both on the European and even the global level. I always seek to join forces with all the partners in the Horizon 2020 project and also our partners in the USA. When all these countries demand from their universities and the publishing houses that we must make a change, the effect is much stronger than if small countries like the Netherlands should try working on its own", says Dekker.

YOU CAN EAT AN ELEPHANT IF YOU DO IT IN PIECES

"You can't eat an elephant in one meal, but you can eat it in pieces. That was the approach we took when we decided to make a roadmap for open science and research," says Riitta Maijala of the Academy of Finland.

The Finnish Government and the Academy of Finland have launched several initiatives on Open Access and Open Science, and Finland is often regarded as a role model for the other Nordic countries. The increase in subscription fees to scientific journals – and the ensuing resistance of researchers and libraries to this – is one of the factors that has boosted interest in Open Science methods.

One of the milestones in Finland was the adoption in 2014 of a roadmap for the implementation of Open Science and research for the next three years.

Surprising discoveries and creative insights

"Our vision for 2017 is that Open Science will lead to surprising discoveries and creative insights. We envision a situation in which research data and materials move freely throughout society, from one researcher or research team to another, between disciplines, to innovative businesses, and to decision-makers and citizens," explains Riitta Maijala.

As Director of Science Policy at the Finnish Ministry of Education, Science and Culture, Dr Maijala led the Ministry's Open Science and Research Initiative (ATT). From 1 July 2016 she is serving as Vice President for Research at the Academy of Finland. Her enthusiasm for Open Science is as strong as ever now that she chairs the round-table discussions within the ATT. These discussions bring together various groups to talk about Open Science within a specific area. The plan is to hold these discussions two to three times per year. The first one will focus on health research.

"Developing the roadmap was very important because it paved the way for our work. The roadmap was

a collective effort involving some 100 people who developed and wrote it together in open groups. We invited both those who had previously expressed an interest in Open Science and those who perhaps didn't care quite as much," explains Dr Maijala.

"A lot of work was also done before we started developing the roadmap, but then people were mostly working alone in their separate corners. But if we wanted to make progress on such an important, complicated matter, it was necessary to bring people together in networks," she adds.

Top down and bottom up

Dr Maijala describes the push to expand Open Science in Finland as both a top-down initiative from the Ministry and a bottom-up initiative from the scientific community.

"We agreed that this could really help to enhance scientific quality. And then we thought: What if we start by defining questions: What we don't know, what we should discuss, what we should do. We didn't have the solutions, but we discussed how it might be possible to find the solutions. As you know, you can't eat an elephant in one meal, but you can eat it in pieces. That was the approach we took," Dr Maijala explains.

She admits that there is still some reluctance to embrace Open Science in Finland, but there is much less resistance than a few years ago.

"In my opinion, the reluctance was expressed in two ways. One reason for the reluctance was very practical, because people felt that they didn't have the tools. For instance, researchers didn't have anyone to help them to make their data accessible. They feared that the transition towards Open Science could become a new burden for researchers who are already very busy. The second reason was that some of the universities seemed not to understand that this is also about organisations, that they should provide support for the researchers who want to adopt Open Science in their work," says Dr Maijala.



Riitta Maijala is Vice President for Research at the Academy of Finland and member of the NordForsk Board.
Photo: Academy of Finland / Anita Westerback

Look to Finland – again

Many will remember that Finland went through an economic depression with rising unemployment in the early 1990s. While the government cut public expenditures in most areas, it decided to increase allocations to science and innovation. A few years later, the economy began to recover, unemployment was shrinking, and companies such as Nokia showed what a small country could achieve in the field of high tech and electronics. According to the roadmap for 2014–2017, Finland's economy will rely on research, innovation and expertise in the future as well. Open Science and research play a decisive role in all of these.

"Right now we are discussing what we should do when the roadmap expires in 2017. We have already made some changes in the way we work, and we will perform an evaluation to identify the areas that need more support," says Dr Maijala.

In 2015, the Open Science and Research Initiative studied how far the different research institutions had come on the road towards Open Science.

"The study showed that some of our institutions have already come very far. The University of Helsinki and the University of Jyväskylä were in the lead and are at the level of collective, well-managed development. Other universities are also moving forward. I am very confident that we will see real progress the next time we conduct a similar study. We have also been training people so that the institutions now have larger staffs who know how to move towards Open Science," explains Dr Maijala.

We should work together

Dr Maijala adds that the Nordic countries, which have many shared values, should work together towards Open Science.

"The Nordic countries have many assets that can be used to develop Open Science together in a clever way. The Nordic countries are much stronger when they work together than when they act alone," she concludes.

WHAT DO THE RESEARCHERS SAY?

According to a report from 2014, most Norwegian researchers are in favour of making research data available for use by other researchers. Almost three of four researchers want to share data, and eight of ten believe that open access to data strengthens research.

Roughly 80 per cent of the researchers who responded to a questionnaire from the Research Council of Norway in 2014 stated that open access to research data strengthens research and that there is an ethical obligation to make data available for validation. According to the report, these are the two arguments in favour of open access to research data that most researchers agree with.

Furthermore, 77 per cent and 74 per cent of the respondents, respectively, stated that open access to research data is good for the education of students and new researchers and that it promotes cooperation on research.

A total of 1 474 researchers took part in the survey. During the previous three years, 64 per cent of them had used research data they obtained from other researchers.

Somewhat surprisingly, the survey shows that there are small differences in views on data sharing across research fields and levels of scientific experience.

Some are sceptical

Although most of the researchers are in favour of using data collected by others, some are sceptical about sharing their own data. The findings in the survey indicate that researchers prefer to have some control over who gets access to their data and how their data is used.

One reason for the scepticism is that it takes valuable time to make the data accessible. Some also think there



The report *Sharing and archiving of publicly funded research data* was presented in 2014. Facsimile: Research Council of Norway

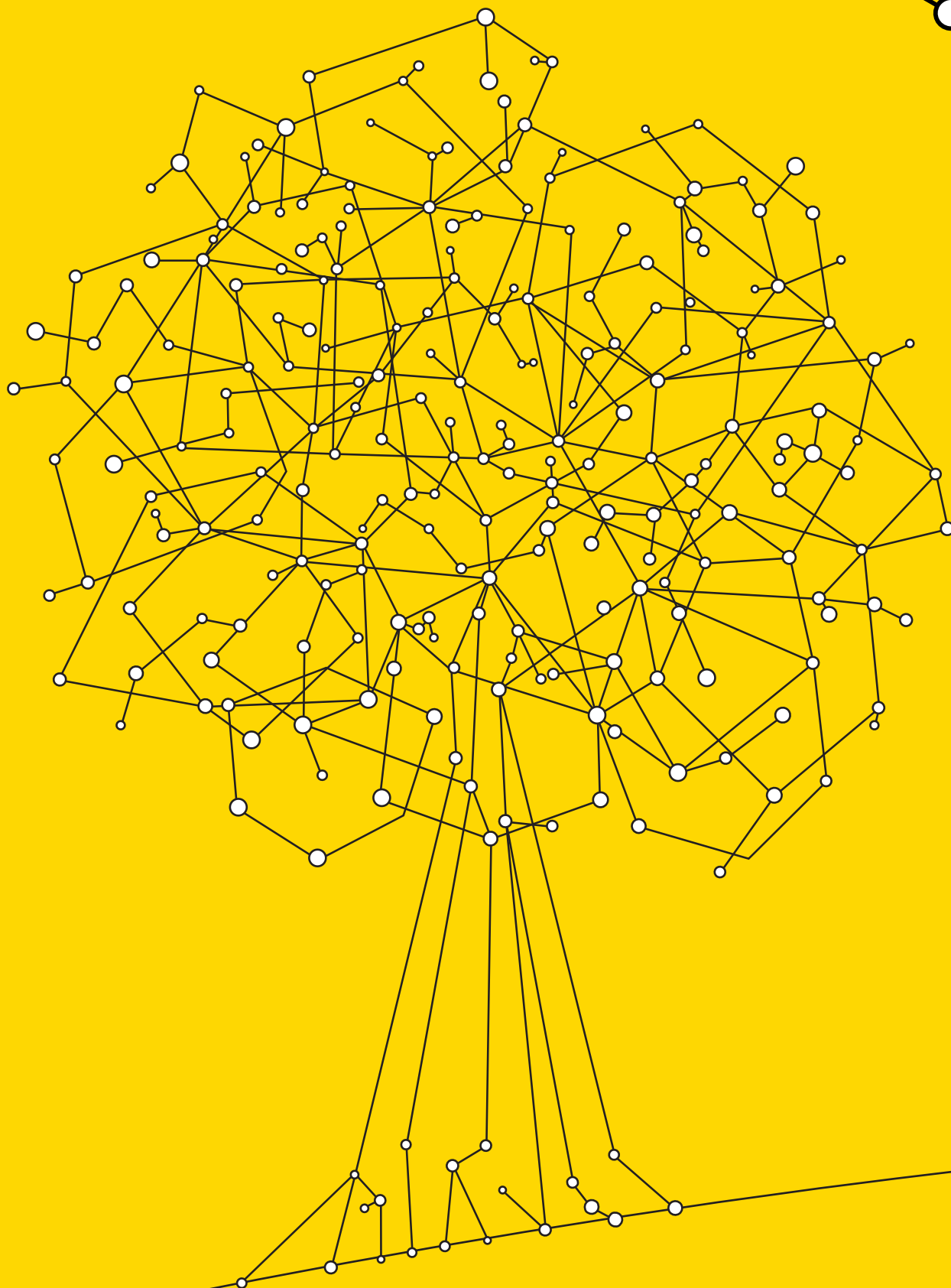
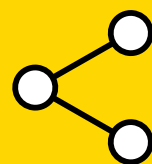
is a danger that their own future scientific publishing could suffer if data is shared. The lack of technical infrastructure is another obstacle.

The report is based on a study conducted by the firm DAMVAD Analytics for the Research Council of Norway.

"The study was used as the basis for the Research Council's Policy on Open Access to Research Data, which was presented towards the end of 2014," says Roar Skålin, Special Adviser at the Research Council of Norway.

National action plan

The Research Council's policy applies to projects receiving funding from the Research Council. A national action plan for open access to research data is currently being prepared, and will be introduced in 2017. The plan will encompass data generated by research and data relevant for research. The Ministry of Education and Research is responsible for drawing up the plan, while the Research Council will provide the factual information needed.



THE NORDIC BIOECONOMY PROGRAMME

NordForsk issued the first call for proposals under the research programme on the bioeconomy in 2016. Three Nordic Centres of Excellence are expected to be funded, with a total budget of NOK 90 million.

It is clearer than ever that we must move from economic growth based primarily on fossil fuels towards a more sustainable, bio-based society. NordForsk has therefore launched a programme to generate new knowledge on how to foster and advance the transition to a bioeconomy-based society in the Nordic countries.

Water is a fundamental component of the bioeconomy and the value chains for bioproduction, for example in the area of transport, primary production, industrial processes and for social well-being. Water will therefore be a common denominator in all of the activities to be funded.

The programme will provide support for cross-sectoral, interdisciplinary activities that can involve actors in both the private and public sectors.

NordForsk's Director Gunnel Gustafsson describes the programme as follows:

"The development of new knowledge comprises the core of this programme. To achieve this, research, innovation and entrepreneurship must work together, with active participation on the part of the private and public sectors, industry, consumers, end-users and others. By taking a Nordic approach, we can view the transition to the bioeconomy as an integrated whole, and contribute new insight into how to combine research and innovation to promote sustainable, bio-based societal development."

The first phase of the call for proposals had a deadline of March 2016. Ten applicants were invited to advance to phase two of the call, which had a deadline of September 2016. Decisions regarding grant allocations are taken in December 2016.







THE BIOECONOMY VASTLY INCREASES THE VALUE OF NORDIC NATURAL RESOURCES

"Burning wood for heat may be the simplest practice in the bioeconomy, but it is also the least profitable. With the help of modern technology we can learn to create far greater value from the Nordic region's primary resources such as marine life, trees in the forest and grain in a farmer's field," says Kristin Danielsen.



THE BIOECONOMY VASTLY INCREASES THE VALUE OF NORDIC NATURAL RESOURCES

There was great interest in response to the first phase of the call in 2016 under the Nordic Bioeconomy Programme, and the 10 best applications have been invited to advance to stage two of the call. The programme has a budget of NOK 90 million, which will largely be used to establish three Nordic Centres of Excellence (NCoE).

Kristin Danielsen, Chair of the Programme Committee and International Director at the Research Council of Norway, can attest to the many excellent ideas that were proposed. While Nordic researchers recognise that the bioeconomy will be a key focus area in the years to come, the concept is not yet widely known among the general public.

"The term 'bioeconomy' emerged in the EU about a decade ago when research coordinators and others began to talk about a 'knowledge-based bioeconomy'. Over time the Nordic research community also adopted the term, and now we have established a separate Nordic programme to help us take the next major step forward," explains Ms Danielsen.

Biotechnology at the core

In principle the bioeconomy is a very old concept, as the efforts of farmers, fishermen, loggers, hunters, etc. have always been precisely to harvest nature's resources. The difference today is that opportunities are on a much greater scale thanks to the three enabling technologies: biotechnology, nanotechnology and ICT. Biotechnology is at the very core of the bioeconomy, according to Ms Danielsen.

"There are many examples of the bioeconomy. For instance, anything that can be produced from petroleum can also be produced from a tree trunk. We can always burn wood for heat, but we reap far greater returns turning it into products such as fish feed, medicines, food flavourings or extremely valuable molecules for use in industry – which ultimately becomes soil again and the biological cycle starts once more. The concepts of closed-loop system and sustainability thinking are what make this field so exciting."

"A prime example is Norway's industrial company Borregaard in Sarpsborg, which has been using wood pulp to produce vanillin and other products for many years. The company has now been awarded NOK 230 million in EU funding to expand production of microfibri-llated cellulose," she adds.

Similar but different

Nordic efforts to develop bioeconomic products can be said to have begun long before the term bioeconomy was coined. However, one of the ideas behind the launch of the Nordic Bioeconomy Programme is that the Nordic countries will be able to accomplish much more in this area by joining forces. The countries are both similar to and different from each other, which makes an excellent starting point.

"The Danes, for example, are very good when it comes to medicines and livestock production, and the Swedes excel at utilising forestry resources. The Norwegians are leaders in the field of biorefinery, among others, while the Icelanders are skilled at using the entire fish, with no waste, and the Finns are first-rate innovators. Bringing researchers from several Nordic countries together is almost guaranteed to generate good results. To be as advanced, innovative and good at building competence as we have to be to make advances in the bioeconomy, we have to unite dynamic groups across national borders. This is the only way we can achieve the critical mass we need in the areas we choose to focus on," Ms Danielsen believes.

She adds that the Nordic countries have a long-standing tradition of excellent cooperation. We share a cultural framework that is more conducive to innovation than more hierarchical cultures and which facilitates transition. In addition, the Nordic countries have similar forests, agricultural areas and aquatic environments, making it possible, for example, to apply a Swedish research group's findings in Norway – and vice versa.

Water as a common denominator

Kristin Danielsen has participated in the development of the new bioeconomy programme from the very outset. She was initially both surprised and somewhat sceptical when water was proposed as a common denominator.

"But my doubts quickly subsided because the arguments were persuasive. Each of the 10 project proposals advancing to the second stage of the call has a slightly different take on water. Sooner or later, the Nordic region will also have problems obtaining enough clean water, and in the shorter term we must turn to the sea to produce sufficient bioresources and food for the global population. We have received proposals ranging from algae cultivation for fish and crustacean farming to development of better refining processes.

The applicants have thought along very different lines, and that is exactly what we were looking for," Ms Danielsen explains.

The Programme Committee will be assisted by an international expert group to decide which of the 10 "finalists" will ultimately be awarded funding. Among other things, special weight will be given to effective cooperation with the public and private sectors, trade and industry, and end users – in order to increase the likelihood that findings can be applied.

Production and recycling

Bioeconomy research should not only focus on creating new products but also on recycling them afterwards. There are already many examples of good ideas that have evolved into products.

"For example, the Norwegian company Norilia calls products made from what we used to refer to as slaughterhouse waste Plus Products. The company's goal is to create added value from 150 000 tonnes of raw materials. Today the world uses 300 million tonnes of fossil-based plastic products, and a number of companies, including Tine in Norway, are testing out bioplastics. Today's soda bottles consist of approximately 30 per cent biological and biodegradable plastic. With the old bottles, the plastic had to be melted down before it could be converted for reuse, but bioplastics can become soil again. In principle, much of the plastic used in products today can be replaced with biodegradable materials," Ms Danielsen states.

Kristin Danielsen strongly believes that the new programme will help to enhance the sustainability of the Nordic countries. Food production must be made more sustainable; we currently throw out too much food which could be systematically recycled within a circular bioeconomy.

"The programme is primarily targeted towards the Nordic countries, but I believe we can lead by example as well. We have an excellent basis for research in this area because we have so much land and sea area and so many biological resources that can be exploited. This means that we have the ability to develop knowledge and products that can also be exported to other countries. The potential is enormous," Ms Danielsen concludes.



PHoto: NordForsk/Terje Heiestad

KRISTIN DANIELSEN – NEW CHAIR OF THE NORDFORSK BOARD

Kristin Danielsen is international director at the Research Council of Norway. She has a doctoral degree in Animal Husbandry from the University of Kentucky and six years' experience from the industry before joining the RCN. She has been head of unit for several different thematic fields within the RCN including bioeconomy, biotechnology, commercialization, and regional innovation.

Danielsen has been Chairwoman for both EUREKA and the Association of Innovation Agencies in Europe (Taftie). She has been a member of the governing boards of several European partnership programmes and was recently part of the European Commission expert group evaluating the Joint Programming process.

In October 2016 she was appointed Chair of the NordForsk Board.



PhD student Norbert Pirk and Professor Torben Christensen on their way to a research station on Svalbard. Photo: NordForsk/Terje Heiestad

THE TOP-LEVEL RESEARCH INITIATIVE EDUCATED A NEW GENERATION OF CLIMATE RESEARCHERS

The Top-Level Research Initiative has not only generated considerable new knowledge about climate change, the Nordic collaboration project has also educated a whole new generation of young, top-notch, interdisciplinary climate researchers.

The five Nordic prime ministers whose initial efforts in 2007 led to what became the Top-level Research Initiative (TRI) can be pleased with what they set in motion. The TRI was intended to promote Nordic contributions towards a deeper understanding of ongoing climate change. During a Nordic Conference on Climate Change Adaptation, held in Bergen in the autumn 2016, it emerged that TRI researchers have thus far published close to 450 scientific articles based on TRI research.

In addition, TRI researchers have contributed to more than 200 publications in relevant research areas. Many of these articles have been published in the most prestigious scientific journals. Over the next few years, the number of publications could reach nearly twice the current total, as a large number of researchers are still working on articles based on the data produced by TRI research. Thus, TRI research as a whole has compiled a large amount of new knowledge about global climate issues in general and the Nordic region in particular.

However, the TRI has done more than just add to the global body of knowledge during its years of operation; it has also supported the training of a total of 79 doctoral fellows and 65 post-doctoral researchers. In short, the TRI has helped to educate a whole new generation of Nordic climate researchers whose interdisciplinary, international orientation will help to generate new knowledge for many years to come, also after activities under the TRI have concluded.

The interdisciplinary generation

"We achieved a unique collaboration among Nordic universities, which established graduate level researcher training schools that helped to educate a whole new generation of Nordic climate researchers. This also laid an excellent foundation for future cooperation between climate researchers, both in the Nordic region and internationally," said Harri Hautala of the Academy of Finland during the conference in Bergen. He has inside knowledge of the initiative after serving as a member of the programme committee which steered the sub-programme, "Interaction between climate change and the cryosphere".

The new researchers have been trained in an interdisciplinary environment that enables them to see things in a broader perspective and employ a wider variety of methods than earlier generations of scientists.

"Research projects such as the Nordic Centre of Excellence for Strategic Adaptation Research (NCoE NORD-STAR) and the Nordic Centre for Research on Marine Ecosystems and Resources under Climate Change (NCoE NorMER) have encouraged biologists, climate researchers, social scientists and economists to work together across departments, institutions and national borders. A number of the TRI research projects have also developed strategies that will ensure continuation of established courses and other educational programmes," explains Jostein K. Sundet, Senior Adviser at NordForsk.

Better mapping of glaciers

During the conference, several researchers presented examples of TRI research findings. Research fellow Solveig Havstad Winsvold from the Department of Geosciences at the University of Oslo showed how to improve efforts to chart glaciers using new satellites that can take more frequent photographs of the Earth. The importance of such mapping efforts became very clear from the data Ms Winsvold presented. She

THE TOP-LEVEL RESEARCH INITIATIVE EDUCATED A NEW GENERATION OF CLIMATE RESEARCHERS



Solveig Havstad Winsvold, PhD student in NCoE SVALI: Photo: Hallgeir Elvehøy

compared older paper maps from the period 1950–1980 with more recent satellite images captured in the period 1999–2006.

The results are disturbing:

"The glacierised area in Norway has decreased by 11 per cent over an average 30-year period. This corresponds to 326 km², which in turn represents an annual decrease of 11 km²," Ms Winsvold explained.

How much are sea levels rising?

One of the major climate research challenges remaining is to provide a reliable prognosis for how much sea levels will rise. Professor Jon Ove Hagen from the Department of Geosciences at the University of Oslo, Project Leader for the Nordic Centre of Excellence for Stability and Variations of Arctic Land Ice (NCoE SVALI), explained that sea levels are currently rising at a rate of 2.5 mm per year. Approximately 1 mm of this is

due to thermal expansion, but the remainder is caused by the melting of glaciers and ice caps. Forty per cent of this melting comes from Greenland alone while the other glaciers and ice sheets in the Arctic represent approximately 30 per cent. The Antarctic accounts for approximately 15 per cent - in spite of its large area - and the planet's remaining glaciers account for close to an additional 15 per cent.

It is unknown whether sea levels will continue to rise by, for example, 20 cm or perhaps up to a metre in the years leading up to 2100.

"We currently see increasing signs of melting in the western part of the Antarctic, which is what will largely determine what happens," Dr Hagen stated. "To try to find the answer, climate researchers are working to combine observational data with increasingly more refined models."

Re-defining the meaning of collapse

In July 2016, the Food and Agriculture Organisation of the United Nations (FAO) presented a report showing that global per capita fish consumption is increasing, but that many fish stocks face potential collapse from overfishing. This triggered numerous media reports proclaiming that "the world's oceans could be dead by 2050". But what does it really mean for a fish stock to collapse? Doctoral student Johanna Yletyinen from the Stockholm Resilience Centre carried out a literature study and collected 18 different definitions from a total of 80 scientific articles.

"I applied these definitions to 18 fish stocks. It turned out that only two of these stocks fulfilled all fish stock "collapse" definitions. I have therefore proposed a new definition based on the spawning stock biomass shrinking, and remaining, below a certain threshold for at least one generation. This definition distinguishes between short-term shrinkage and long-term collapse," stated Ms Yletyinen, one of the 18 doctoral students at NCoE NorMER.

Soot behind rising temperatures in the Arctic

Research fellow Meri Ruppel from the University of Helsinki presented unsettling data on soot particles (black carbon) deposited on snow and ice in the Arctic. Soot is one of the primary drivers of global warming, because soot darkens the light, reflective surfaces in snow or ice-covered areas, causing more sunlight to be absorbed.

Previous measurements have shown that atmospheric soot particles in the Arctic have decreased by approximately 40 per cent since 1989. However, Meri Ruppel's research shows that black carbon deposition via rain and snowfall has increased, but is not detected by atmospheric measurements.

Forest fires, factory emissions, the transport industry and the burning of agricultural waste produce substantial amounts of soot. "My hypothesis is that the increased amount of soot deposited in the European Arctic comes largely from flaring in oil and gas fields in Northern Russia as well as from the use of diesel vehicles," Ms Ruppel stated.

"This is something politicians need to know about. My advice is that short-term measures aimed at mitigating climate change should focus on soot," she says. She added that no corresponding increase on Greenland's inland ice caps has been shown, which confirms the

theory that the precipitation in the European Arctic is coming from areas in close proximity.

Research is a must, but not sufficient in itself

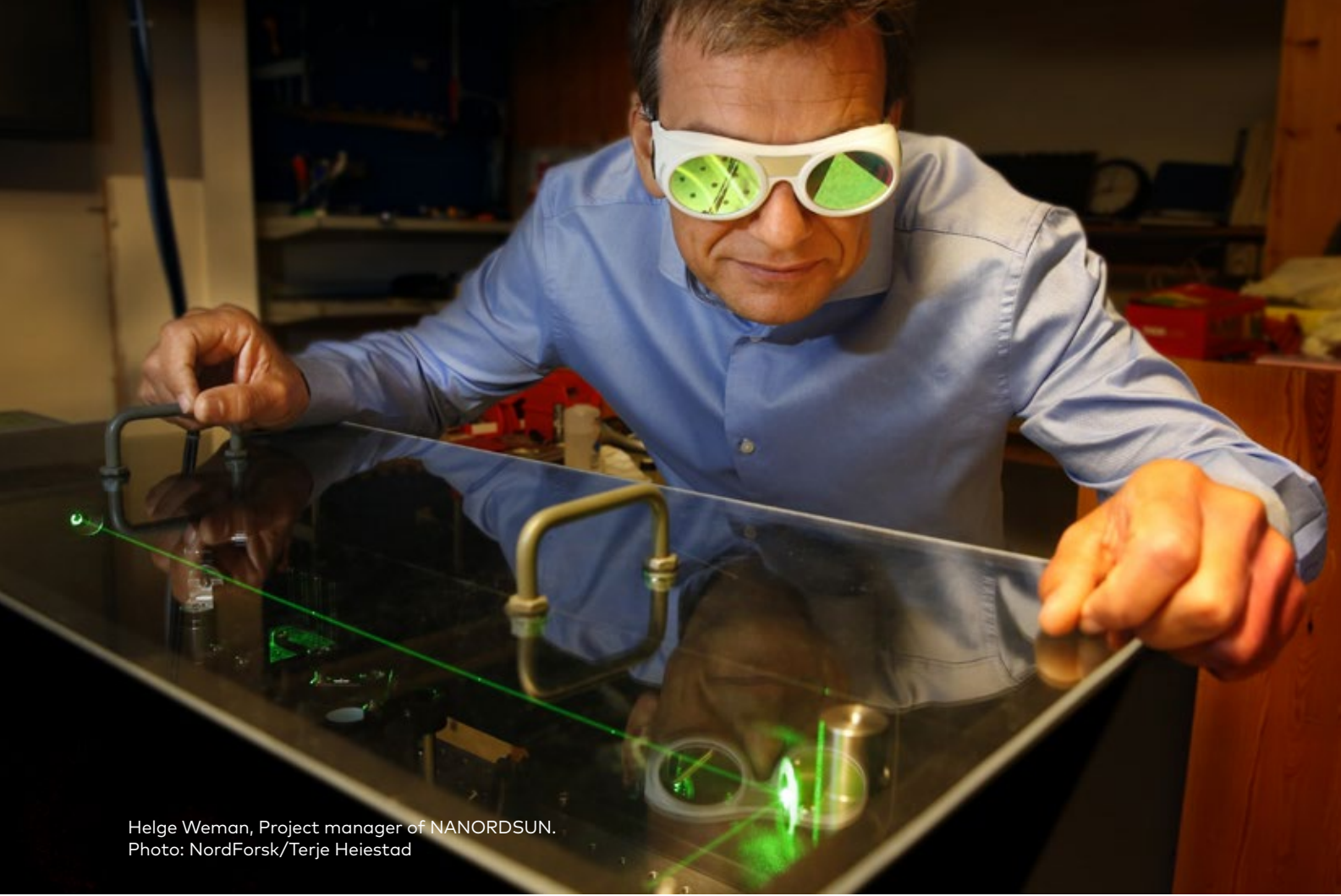
The day concluded with a final word of warning from Professor Richard Klein, co-director of the final phase of NCoE NORD-STAR: There is no guarantee that better information and knowledge will lead to better decisions. "Performing good research is not enough; we also have to ensure that these findings reach the decision-makers. There is no guarantee that research leads to better decisions unless we actively incorporate decision-makers in our studies," Mr Klein stated, citing atmospheric scientist, Roger Pulwarty's well-known thesis: "We should not help people do the wrong thing with better information."



Professor Jon Ove Hagen, Project Leader for NCoE Svali
Photo: NordForsk/Terje Heiestad

FACTS ABOUT THE TOP-LEVEL RESEARCH INITIATIVE:

- The Top-level Research Initiative (TRI) is the largest joint Nordic research and innovation initiative ever undertaken.
- The overall budget for the TRI was DKK 400 million distributed over a five-year period.
- The TRI comprised six sub-programmes.
- For more information, please visit the TRI webpages.



Helge Weman, Project manager of NANORDSUN.
Photo: NordForsk/Terje Heiestad

JOINING FORCES TO PROMOTE GREEN GROWTH

The Nordic countries have committed themselves to ambitious climate goals in the years leading up to 2050, with aims of raising energy efficiency and making the transition to a low-carbon society. Achieving these goals will require a focus on green growth and the development of sustainable solutions in both the public and the private sectors in the Nordic countries.

In spring 2016 the first call for proposals was issued for the Nordic Green Growth Research and Innovation Programme – a new joint initiative between Nordic Innovation, Nordic Energy Research and NordForsk. The

programme is a continuation of the Top-level Research Initiative (TRI) and is targeted towards thematic areas related to climate challenges and sustainable societies. The programme has a budget of NOK 73 million and a large number of applications for collaborative research and innovation projects were received in response to the call for proposals.

The directors of Nordic Innovation, NordForsk and Nordic Energy Research each have high hopes for the new joint programme based on experience from the Top-level Research Initiative:

**Carina Christensen,
Managing Director, Nordic Innovation:**

“Through the Top-level Research Initiative, the Nordic countries have shown what can be achieved through Nordic cooperation and close collaboration between industry and researchers. I would specifically like to

highlight the results from the NORDICCS project. How and where to store CO₂ is a global challenge, and this project brought together research institutions and industries in an excellent way to provide solutions and further studies. The project has created synergies and strengthened the Nordic Carbon Capture and Storage stakeholders, reduced cross-border barriers and created a Nordic CCS network of excellence. Truly something we can be proud of."

Gunnel Gustafsson, Director, NordForsk:

"We may say that the Nordic prime ministers were forerunners when they started the Top-level Research Initiative close to ten years ago, and already at that time laid the ground for contributions to the UN Sustainability Goals. Issues like renewable resources and sustainable development were not on the agenda as extensively at the time as they are today. The DAMVAD evaluation of the TRI shows that the Nordic Centres of Excellence were especially successful in

integrating research, education and innovation, and topics and success factors from the TRI are solid building blocks for the new Green Growth programme.

Hans Jørgen Koch, CEO, Nordic Energy Research:

"What is most important about a joint initiative is that it is used to enhance the potential of the selected Green Growth projects to be more than just scientifically, technologically and commercially sustainable. These projects must also be viable in the sense that they are politically feasible and beneficial for Nordic trade and industry."

Joining forces: Gunnel Gustafsson, Director, NordForsk – Hans Jørgen Koch, CEO, Nordic Energy Research and Carina Christensen, Managing Director, Nordic Innovation. Photo: NordForsk/Terje Heiestad



IS IT POSSIBLE TO APPLY A GENDER PERSPECTIVE TO ALGORITHMS?

In 2013 NordForsk adopted a gender equality policy that applies to all research projects granted funding. In addition to promoting gender balance within the research groups, the policy attaches importance to incorporating gender perspectives in research. But what does incorporating gender perspectives in research mean?

"A gender perspective is different from a simple headcount. It is about how you set the research agenda, select research topics and formulate questions and interpret data," says Martina Schraudner, head of Fraunhofer Center for Responsible Research and Innovation, and the Department of Gender and Diversity in Organisations at the Technical University of Berlin.

Dr Schraudner is an adviser on gender, diversity and innovation in various European contexts, including as a Science Leader in the Gender in Science initiative, which was launched under the EU's Seventh Framework Programme. She is also a contributor to the EU's Gendered Innovations website, which develops methods of gender analysis for use by researchers and engineers.

NORDFORSK'S POLICY ON GENDER EQUALITY

NordForsk's gender policy is designed to enhance understanding of the ways in which gender awareness improves the quality of Nordic research and research collaboration. The gender policy seeks to achieve two aims:

- Gender balance, to ensure balance in the number of men and women.
- Incorporation of gender perspectives into research topics to reveal gender-based differences because these often have a significant impact on the research results.



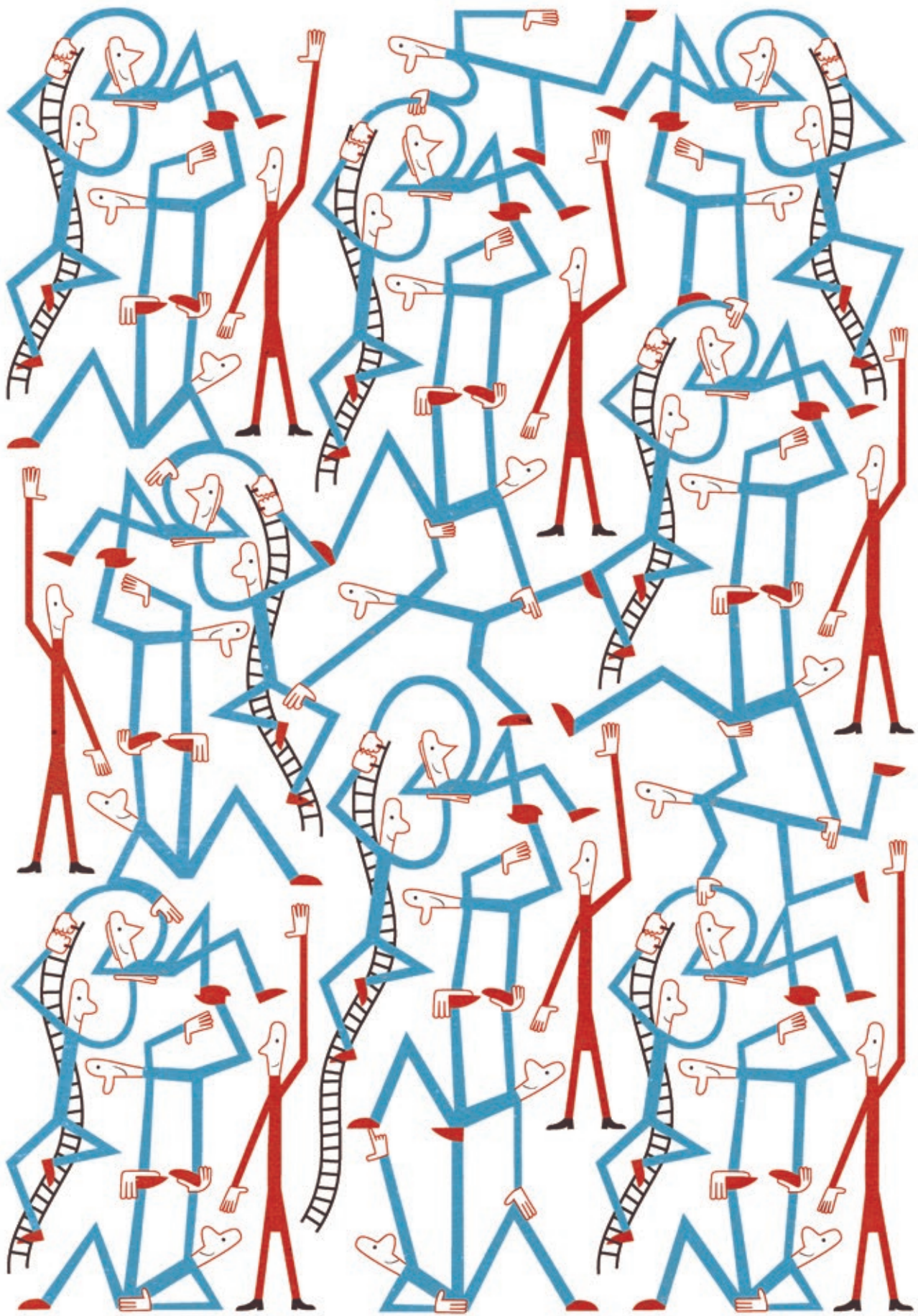
According to Professor Martina Schraudner of Fraunhofer Center for Responsible Research and Innovation, gender perspectives in research involve formulating questions and interpreting data. Photo: Fraunhofer

"I can give you a good example of why a gender perspective is important from the area of mobility research," says Dr. Schraudner. This is a field that often includes a core data set to be analysed. "Parents of small children make a lot of short trips in connection with their care activities. But if you don't include care activities as a reason for mobility, then you might not understand why people are travelling such short distances."

"In this case, gender perspectives are important for the quality of the research, and you need to think about this beforehand in order to be able to ask the correct questions. If you make a questionnaire and don't include care activities, then you risk not seeing something that is right in front of you," says Professor Schraudner.

Different perspectives

Discussions about gender in research are often about the "leaky pipeline", i.e. the proportion of women in the world of research decreases higher up in the hierarchy. In order to alleviate that imbalance,



IS IT POSSIBLE TO APPLY A GENDER PERSPECTIVE TO ALGORITHMS?

professor Schraudner recommends to always make sure that women are represented in decision-making bodies, especially those making decisions on strategic research priorities. But is it not the case that the presence of more women automatically entails an incorporation of gender perspectives in research?

"I think it is hard to bring the gender perspective into different research themes and teams via the gender balance," Martina Schraudner states. "This quickly becomes an idea where men are responsible for this and women for that. That is not how it works. The results from an experiment should be the same whether it is run by men or women."

Instead, it is a matter of practising how to view things from different perspectives when planning an experiment, and one does not need to be a woman to be able to do that.

"This is where the Nordic countries really have an advantage, because the society has a different picture of gender roles. I think you could use this advantage even more, because you are already used to considering different perspectives," says the professor.

Biosciences are also gendered

One of the core issues Dr Schraudner fronts is that diversity leads to better research. In this regard, gender difference can be seen as a parameter in line with cultural and age differences.

GENDER IN THE NORDIC RESEARCH AND INNOVATION AREA

The Nordic countries are known for their focus on gender balance and equal opportunity. But there is nonetheless gender imbalance in the top positions in the research community in spite of the fact that women researchers hold a large proportion of lower-level research positions.

NordForsk's research programme Solving the Nordic Gender Paradox: Gender Gaps in the Nordic Research and Innovation Area is a collaboration between Finland, Iceland, Norway and Sweden, and has a total funding of 42 MNOK. In 2016, the programme has awarded funding to two Nordic Centres of Excellence: the Nordic Centre for Research on Gender Equality in Research and Innovation (NORDICORE) and Beyond the Gender Paradox.

"People with different worldviews bring new ideas into the mix. This is also the advantage of interdisciplinary research. For me, it is one of the most important arguments for having diverse teams and for giving consideration to the gender perspective," says Martina Schraudner.

Dr Schraudner cites another example, this time from her own subject area: bioscience. The single-celled organism, the Oomycete (water mould) reproduces when a group of cells combine to form an organism-like structure.

"Everybody was looking for a master cell that signaled to the other cells that they should come together and reproduce. But it turned out this was not the case. What makes the fungi reproduce instead is the concentration of a certain substance that is released out into the environment. When the concentration is high enough, it is a signal to the cells to form this organism-like structure.

This is an example of how you need to have a completely different picture of the world. Otherwise you do not think to look for something like that," says Martina Schraudner.

"Of course, there are areas where it really is not easy to apply a gendered perspective, but it is not impossible. Let's say you are using an algorithm. When we talk about pure math, there is perhaps no gender perspective. But once you start to apply the algorithm, then quite a lot of gender perspectives will come into play," states Dr. Schraudner. "This is what we need to learn to incorporate."



MORE FORMALISATION INCREASES GENDER EQUALITY

Why are there so few women in senior-level researcher positions in the Nordic countries? The Swedish Research Council has recommended formalising the application assessment process to a greater extent as a way of counteracting gender bias when the research councils allocate funding.

What is actually happening when women researchers sometimes receive less research funding than their male colleagues? The Swedish Research Council is now examining its own application assessment process to counteract unconscious bias when allocating research funding.

"Our observations refute the notion that the processes are objective and scientific," says Lisbeth Söderqvist, an analyst in the Department of Research Policy at the Swedish Research Council. She is one of the authors of the report entitled "A Gender Neutral Process? A qualitative study of the evaluation of research grant applications 2014", which is the most recent of several reports examining unconscious bias in the allocation of research funding. "Things happen in those meetings that are not scientific."

Informal information distorts the process

Since 2012 Dr Söderqvist and her colleagues have participated as observers in some of the panel meetings held when the research councils take decisions on grant allocations. One of the things they have observed is how informal information and networks can influence the assessment of grant applications.

"It is not unusual at all to hear someone say 'He's a good guy, he works hard for it' or 'he's an up-and-coming star' when applications are being assessed," explains Dr Söderqvist. "And of course there is nothing in the application about the person being a 'good guy' or an 'up-and-coming star'. That is someone's opinion and they want to share it with the others. But then the network begins to play a role in the application process and it gives somebody an unfair advantage. That is not acceptable."



Analyst Lisbeth Söderqvist
Photo: Swedish Research Council

In their observations, Dr Söderqvist and her colleagues have noted that this puts women in particular at a disadvantage. Men are much more likely than women to advance their careers through their networks from this type of recommendation. To counteract this tendency, the authors of the report recommend formalising the application assessment process to a greater extent.

Training can help

"The chairs of our evaluation panels are university professors. But the fact that a person is a professor does not necessarily mean that he or she is good at chairing an evaluation panel," says Dr Söderqvist. This is why she and her colleagues have recommended providing training for the chairs so that they improve their skills in leading an evaluation panel.

The Swedish Research Council itself has formalised the process to a greater extent. All panel meetings begin with a presentation by an employee of the Swedish Research Council who explains what the referees are supposed to look at in the meeting and how the meeting should unfold. The issue of gender equality is addressed at this time. This makes it easier for the chair to, for example, interrupt statements based on informal information and get the discussion back on track. "This is not only about gender equality, but also about having a good process in general. The chairs must ensure that everyone is heard and that everyone is in agreement before a decision is taken," says Dr Söderqvist. "Not everyone is automatically good at this, but we should ensure that the process is carried out properly. After all, these meetings are very important."

WITHOUT PRIVACY WE DON'T HAVE FREEDOM

Powerful forces are pushing for increased surveillance of society, but is it really possible for mass surveillance to ensure a secure society? Professor Angela Sasse believes the price will be too high.

"It has not been proven that the key to a more secure society lies in mass surveillance. It's an illusion that if you have more data then you can find everything or everyone. You don't make the needle easier to find by making the haystack bigger, states Angela Sasse," professor of Human-Centred Security at University College London and Director of the UK Research Institute in Science of Cyber Security (RISCS).

A platform for European dialogue on societal security

Dr Sasse has been researching human-centred aspects of security, protection of personal privacy, identity and trust for over 15 years, and in her view NordForsk's Nordic Societal Security Programme is examining this area from a fresh perspective. She was one of the speakers during NordForsk's session on societal security at the European Science Open Forum (ESOF) held in Manchester in July 2016.

"I think that the programme's focus on a resilient digital society is absolutely spot on. Building an understanding of what that means and how we can achieve it is essential for the future. As a European citizen I would hope that the Nordic programme will continue to collaborate with other countries, as seen in the latest cyber security call where the UK and the Netherlands were involved. The programme could act as a platform for extended dialogue throughout the research area in Europe," Professor Sasse said, adding:

"I would say that the Nordic Societal Security Programme emerged as a needed counterpoint to some of the more technology-focused EU research programmes, establishing another perspective on how we should confront security issues."



Professor Angela Sasse at NordForsk's session on the Arctic at ESO 2016.
Photo: NordForsk/Terje Heiestad

WITHOUT PRIVACY WE DON'T HAVE FREEDOM

International cooperation a must

Professor Sasse emphasises the importance of international research cooperation in general and particularly within the area of cyber security.

"The NordForsk programme clearly outlines the importance of international cooperation, both in societal security in general, but perhaps especially on cyber security, as there are no borders digitally. I've been involved in European research projects for 25 years and it has been of enormous value to see the bigger picture and to be able to combine the best of ideas and technology that we have. In the future, international research cooperation on cyber security will be even more important as some countries have a shortage of young people pursuing the training needed to work in the field. With international cooperation universities gain better access to a large pool of talent to work on the next generation of technology and make it safe and secure," she says.

The professor believes that shared values and a general trust in political authorities are two of the reasons why the Nordic region has become a role model for the rest of Europe in the area of societal security.

"We need to think about how to create a resilient digital society instead of thinking of cyber security as a national security problem. The Nordic countries have understood that this is the way to go, and are showing us through their leadership that collaboration is the key. The Nordic societies have the same set of values and the citizens have a very high level of trust in their governments. This makes it easier to work together on cyber security and other security issues, as the populations trust their governments to do their best to protect them. That is not always the case in other countries, and something we can all learn from," Dr Sasse explains.

New security threats

When asked to elaborate on the main risks in cyber space, Professor Sasse recounted an old story about a bank robber.

"Willy Sutton was asked by reporter Mitch Ohnstad why he robbed banks. According to Mr Ohnstad, he replied, "Because that's where the money is." In the past decade many of our transactions, especially those of value, have moved online, for instance, internet banking and retail shopping, so it's natural that crime has followed us there," says Dr Sasse.

"It becomes problematic if the internet is disrupted or we just don't feel safe there anymore. The impact on our lives will be significant."

Technological development has exploded over the past 10–15 years, posing entirely new risks to society.

"Ten to fifteen years ago we talked about hackers and others who caused trouble partly for fun or because they wanted to show off what they could do or were simply bored, but in 2016 we have to deal with sophisticated organised crime. For instance, we have "companies" that extort people by locking their computers and demanding money to unlock it through "customer service". Ironically people who experience this often say that the "customer service" was very good. It's very sad, but that's how the landscape has changed," Dr Sasse says, before offering a few internet security tips.

"The single best advice is not to reuse passwords that you use for very sensitive accounts: anything related to the government, internet banking or your main email account. The main reason is that criminals now collect information and profile individuals. And if they are able to get a hold of one of your passwords, which is fairly easy, the damage could be severe," Sasse explains.

"A more general piece of advice if you find yourself in a situation where you suspect someone is trying to trick you, either through an e-mail or a call, stay calm and speak with other people. The criminals want to isolate and deceive you. It is always a good idea to speak with family, friends or colleagues," she points out.

Eroding trust in the authorities

Cyber crime takes many different forms and Dr Sasse believes the most damaging actions target the general population's trust in the authorities.

"One route is trying to disrupt the country's national economy or infrastructure, transport or electricity. The other route, which is more subtle and that we need to consider more, is attacks that systematically try to undermine the credibility of a government and its trust. Spreading disinformation that leads to people not trusting the government, for instance, hijacking key information channels such as a popular social network like Twitter. If the message is credible it can spread quite quickly and cause damage, even more so since news agencies and news outlets pick up information from each other, often without the necessary background check. This can create panic and weaken

the credibility of the alleged sender. In terms of the resources required, it is easier to execute this type of attack than others and such actions represent a major security threat," Professor Sasse explains.

"There are fundamental problems with the way we communicate online. If you receive an email from a government official, you don't have an easy way of checking if it is the real deal," the professor states. "We need user-friendly infrastructure available to ordinary citizens, with technology that makes it possible to encrypt and verify where messages come from. Cyber security shouldn't only be about stopping the bad guys from doing something; it also means building systems that are resilient, that we still can get something done, even if there is a major disruption."

More surveillance is not the answer

In the struggle to ensure societal security the debate invariably turns to how much surveillance should be introduced and how much consideration should be given to protecting an individual's right to privacy.

"I think that all leading security researchers agree that there isn't a trade-off between security and privacy. The ability to have privacy is an essential part of a free society, even if law enforcement agencies or other government segments believe more surveillance makes their work easier. I don't think anyone really wants total surveillance and government control," states Dr Sasse.

"From a scientific point of view it has not been proven that more surveillance yields a 100 per cent secure society, so supporters of surveillance should be very careful about making that very promise."

Believes young people want privacy protection

Dr Sasse also thinks that young people will engage in more privacy-protective behaviour and will increasingly avoid commercial organisations that keep track of their digital lives.

"Today's digital generation of young people growing up is used to spending a lot of time online. From an early age they interact socially through computers, phones, etc. As they grow older they will probably become very aware of how much they are under surveillance by others who know what they read, when they read, what kind of music they listen to, and – if they have a Fitbit or similar tracker – how often they exercise, how long they sleep and, potentially, their emotional state. I think we will see that young people will engage in more privacy-protective behaviour, for example by using encrypted channels," concludes Professor Angela Sasse.

FACTS ABOUT THE NORDIC SOCIETAL SECURITY PROGRAMME

The Nordic countries have cooperated closely on societal security for several decades. In recent years, this tradition has been supplemented by a number of political initiatives across national borders. A Nordic expert group explored the prospects for Nordic cooperation in the field of societal security. Based on their recommendations, the Nordic Societal Security Programme was launched in 2013.

Following the programme's first call for proposals, two Nordic Centres of Excellence were granted a total of NOK 45 million. The overall budget is NOK 123 million.

An international call for proposals in the area of society, integrity and cyber security was completed in March 2016 in cooperation with the Economic and Social Research Council (ESRC) from the United Kingdom and the Netherlands Organisation for Scientific Research (NWO).

The Nordic Societal Security Programme is currently being funded by the Academy of Finland, the Icelandic Centre for Research – RANNIS, the Swedish Civil Contingencies Agency, the Norwegian Directorate for Civil Protection, the Research Council of Norway and NordForsk.

MAKING THE FAMILIAR UNFAMILIAR

NordForsk's thematic programme Education for Tomorrow has signed a collaboration agreement with the Netherlands Initiative for Educational Research (NRO). The collaboration will focus in particular on linking research more directly to practice and policy. The aim is that researchers will take advantage of the potential to be found in comparing schools and teaching methods in the Nordic countries and the Netherlands.

"Educational researchers in the Netherlands are used to looking to other countries. In fact, they are often blamed by practitioners for not being available enough here at home," says Professor Theo Wubbels, head of the programme council of the Netherlands Initiative for Educational Research (NRO), when asked what the NRO hopes to gain from issuing a joint funding announcement with NordForsk.

"But in relation to research focused on policy and practice, our efforts to look to other countries is underdeveloped. Of course there are individuals who have contacts in other countries, but we lack a more systematic approach. So for me this collaboration is the first step towards NRO adopting a broader international orientation."

NRO was founded as an independent educational research council in 2012. Up to then, the field of educational research had been included as a programme under the Netherlands Organisation for Scientific Research (NWO). However, following an evaluation of Dutch educational research, a decision was taken to establish a separate educational research council with particular focus on linking research with policy and practice. The collaboration with NordForsk is NRO's first instance of international cooperation.



Professor Theo Wubbels is head of the programme council of Netherlands Initiative for Educational Research (NRO). Photo: Utrecht University

Small differences are interesting

NordForsk and the Nordic countries are interesting for NRO, in part because the educational systems in the countries are similar to each other. "When comparing conditions in various countries, it's an advantage if the differences are not too large. The small differences make it interesting to learn from each other," says Dr Wubbels. He then goes on to explain:

"For example, if you want to study how a team of teachers works together with special-needs pupils, it's helpful to be able to compare schools across countries. This provides a better basis for studying how specific details affect the whole and for understanding how collaboration among teachers can work. You could say that you have a larger natural variation providing a wider basis for comparison," says the professor.

"In their project proposals for the upcoming call, researchers must think about the kinds of differences that exist between the school systems and how these may have affect what is happening."

"Knowledge roundabout" ensures collaboration

The close connection between research, practice and policy will also be a key theme in the funding announcement with NordForsk. What has the special focus on

practice and policy of the Dutch educational research council led to in terms of results so far?

"We are still a young research council, so it's hard to say how much of an effect the closer cooperation with the field of practice has had on the research and vice versa," says Dr Wubbels. "But I can give an example of the projects we have funded which have been going on for half a year. There is a 'knowledge roundabout' in which the teachers can ask questions and the educational researchers provide answers. This is a structured, concrete way to help teachers with their immediate questions."

The council is developing another, longer term means of helping to link research, practice and policy. NRO's programme was developed on the basis of input from teachers and policymakers, who had the opportunity to propose research questions and areas. Practitioners and policymakers are also a permanent part of NRO's programme committees. This is a way to address the criticism that educational research has far too little influence on practice.

Differences in context play a role

"It will be interesting to see how the researchers take advantage of the potential inherent in the funding announcement," says Professor Wubbels. "One of the assessment criteria will be how good of a method they have for making use of the differences in context that exist in the countries in their projects."

"In the field of cultural anthropology we say that looking at another culture makes the familiar unfamiliar," explains Dr Wubbels. "Basically, this is what I hope the researchers will learn from cooperation across national borders: That they learn to reflect on how their own system, preferences and preoccupations influence their perception of reality."



Illustration: Elisabeth Moseng

INCLUSIVE EDUCATION ACROSS BORDERS: RESEARCH PROJECTS ORIENTED TOWARDS PRACTICE AND POLICY

- The programme is a cooperative effort between the Research Council of Norway; the Academy of Finland; the Icelandic Ministry of Education, Science and Culture; the Swedish Research Council; the Netherlands Initiative for Educational Research (NRO) and NordForsk.
- First call in 2016.
- The topic of the funding announcement will be learning among and teaching methods for children and pupils with special needs. The total funding pot is EUR 2.25 million.

MORE RESEARCH IN THE PRIMARY SCHOOLS

There is a need for a stronger link between theory and practice in educational research. The Education for Tomorrow programme committee, in cooperation with the Netherlands Initiative for Educational Research (NRO), is seeking to expand this research area and build new bridges between researchers and teachers.

"Researchers have often gone out to study schools without involving the staff who work at the schools," says Eva Björck, a professor of special education who sits on the Education for Tomorrow programme committee. "But we need more contact between theory and practice, also with regard to the scientific basis for teacher education. Quite simply, this is an under-researched area."

Until now, the Education for Tomorrow programme has focused mainly on upper secondary education and professional education, and less on younger children in school. The new collaboration with the Netherlands Initiative for Educational Research (NRO) provides a perfect opportunity to change this.

"In many ways, we have the same point of departure," says Dr Björck about the collaboration with the Dutch educational research council. "NRO has the same need to improve the connection between research and practice, and like the Nordic countries, they have already been working on this for several years. This is clearly an area where it would be to our advantage to cooperate, so we can learn from each other and benefit from each other's expertise."

Research-based knowledge

Another purpose is to provide useful information to those working in the area. The Education for Tomorrow programme will promote well-designed research projects that involve practitioners, thereby increasing the amount of research-based knowledge available.

"I am hoping that we can look at different models and ways of working with practice and research. There is a need for researchers to cooperate with teachers and staff in the schools so that we can identify various models for developing the research area," says Dr Björck.

"It is exciting that this initiative comes from another country, which gives NordForsk and the Nordic countries a chance to cooperate outside of the Nordic region," says Dr Björck. "Together we can achieve excellent research, and this is ultimately why we want to collaborate."



Eva Björck is the vice chair of the NordForsk Board, Secretary General, Committee for Educational Sciences, The Swedish Research Council and a member of the Education for Tomorrow programme committee.
Photo: NordForsk/
Terje Heiestad



GREATER AWARENESS OF BIOETHICS

The Nordic Committee on Bioethics works to achieve greater awareness of bioethical issues in the Nordic countries. In cooperation with NordForsk, the committee is launching the third edition of *Legislation on biotechnology in the Nordic countries*, which provides an up-to-date overview of legislation in a variety of areas, including assisted reproduction, human biobanks, cloning and embryo research.

Photo: Shutterstock



The report was first published in 2014, and has since gained the interest of practitioners, researchers and legal professionals in the Nordic countries and Europe in general.

"One of the committee's tasks is to follow legislative developments in biotechnology in the Nordic countries, and we are very pleased that the two previous editions were so well received. Given the high pace of change in matters related to bioethics, we believe it is important to update this overview on an annual basis, for instance to promote understanding of the somewhat different laws on bioethical issues within the Nordic region," says Arnar Pálsson, who is the 2016 Chair of the Nordic Committee on Bioethics and an associate professor at the Institute of Biology at the University of Iceland.

In recent years the committee has arranged conferences and published reports on topics as diverse as ethical perspectives on sexual identity and gender, reproductive technology and surrogacy, and ethical dilemmas relating to animal welfare.

The committee organised a meeting in 2015 on issues relating to the difficult decisions that the health care services face in cases when life-extending treatments come at high monetary cost.

"When a patient is diagnosed with a rare disorder or fatal disease, the health care services are to offer



Chair of the Nordic Committee on Bioethics, Arnar Pálsson. Photo: NordForsk/Tor Martin Nilsen

the best available treatment. But some medicines and treatments are very expensive, and the health care budget is finite, which means that the medical personnel have difficult decisions to make. There are strong moral grounds for not denying treatment on the basis of cost, but at the same time the public health care services have limited resources.

How do we decide whom to treat and not treat? The Nordic countries have different practices and regulations for addressing these issues, and have called for more collaboration on this topic. We plan to revisit this in an upcoming meeting," concludes Pálsson.

ABOUT THE NORDIC COMMITTEE ON BIOETHICS

The Nordic Committee on Bioethics was founded in 1989 to promote Nordic cooperation and exchange of information in the area of bioethics between scientists, parliamentarians, opinion leaders and public officials.

The committee is made up of two members from each Nordic country. Members are nominated nationally and are appointed for a three-year term by the NordForsk Board. The committee selects its chair from among the members and the Chair rotates annually among the countries.

The Nordic Committee on Bioethics has been administered under the auspices of NordForsk since 2014.



Legislation on biotechnology in the Nordic countries is available at: nordforsk.org.



MANY GOOD IDEAS FOR NORDIC RESEARCH COOPERATION

In October 2016, NordForsk organised a meeting in Oslo for over 30 stakeholders to discuss new ideas and suggestions for the thematic areas, funding forms and framework for future Nordic research cooperation.

The meeting was hosted by the NordForsk Board, and participants included the leadership and other key personnel from national research councils, the higher

education sector and specialists in various important thematic areas. There was active exchange both in plenum and in the smaller groups, and many different viewpoints were presented.

NordForsk's role as a facilitator and how best to align joint Nordic initiatives with national priorities were among the main topics of discussion. The NordForsk Board and staff will use the input provided in its continued efforts, and a follow-up meeting is planned for 2017.



- 1 Kristin Danielsen and Annika Sølvará
- 2 Gunnel Gustafsson and Eva Björck
- 3 Juni Palmgren and Agneta Bladh
- 4 Fredrik Melander
- 5 Hallgrímur Jónasson
- 6 Ragnhildur Helgadóttir
- 7 Edvard Johansson
- 8 Sven Stafström
- 9 Eivind Hovden and Vidar Leif Haanes
- 10 Johanna Hakala

Photo: Terje Heiestad/NordForsk

RENEWING THE NORDIC FAMILY

The Nordic family of cooperating institutions has been given a new visual profile, and the latest issue of NordForsk Magazine presents a new logo, new colour palette and a new, modern look.

More than just a facelift, this new framework is part of a major project to modernise and brand the Nordic cooperation.

After taking up the post of Secretary General of the Nordic Council of Ministers in 2013, Dagfinn Høybråten launched a comprehensive project aimed at modernising and revamping Nordic cooperation. In June 2014, the Nordic Ministers for Co-operation adopted a major reform package. The report *Nordens tid er nu* (The time for the Nordic region is now), describing the continuation of the modernisation project, was published in autumn 2016.

"We are seeking to safeguard the future of Nordic collaboration to ensure that our activities meet the challenges we face both today and tomorrow," said Dagfinn Høybråten. "Our cooperation must be of relevance for our inhabitants and we will work together

on issues when our countries consider it sensible to do so, whether it is a question of quality or volume."

The Secretary General wishes to incorporate a more long-term perspective than is commonly the case in politics in order to use analyses and future-oriented knowledge development to gain a more strategic overview of the big picture questions.

"The Secretariat to the Nordic Council of Ministers will increase its reporting and analytical processes while cutting down on administration," Mr Høybråten says.

The reform targets work methods in the political collaboration, all the way from the ministerial level through the Nordic Council of Ministers Secretariat to the institutions and offices.

Thus, the process of ensuring that the substance of the cooperation is relevant, and that the cooperation always remains focused on the right things, is part and parcel of the ongoing structural and organisational development.

Popular but "unknown"

While Nordic cooperation is both popular and welcomed by the populations of the various countries, there is generally little knowledge about the areas in which the countries actually cooperate.



Secretary General in the
Nordic Council of Ministers,
Dagfinn Høybråten.
Foto: NordForsk/Kim Wendt

RENEWING THE NORDIC FAMILY

"Getting the message across is a challenge, and it is important to make Nordic inhabitants aware of initiatives undertaken and results achieved," the Secretary General explains.

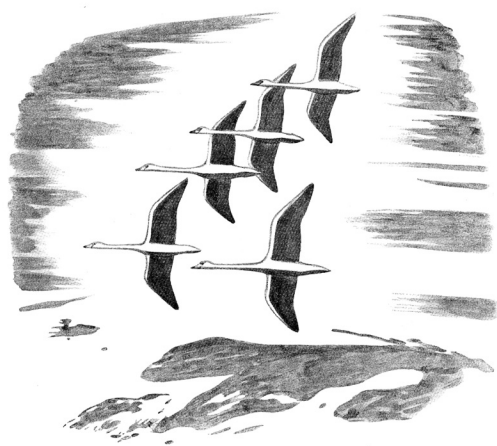
In keeping with this, it is also important for the entire Nordic cooperation family to have a unified, recognisable visual representation.

The original swan logo denoting Nordic cooperation was designed in the 1980s, and the overall revamping of Nordic collaboration provides a good opportunity to upgrade the visual profile as well.

"Visual elements are also part of the digitisation component of the modernisation project: the swan logo graphic was not adaptable to new digital channels and small formats, so a change was called for," says Dagfinn Høybråten, who is pleased that NordForsk is following up in this effort.

Director of Nordforsk, Gunnel Gustafsson, commented on the ongoing process, saying:

«Swans of the north» Poem 1936.
Illustration: Ernst Hansen



The Swan. Norden symbol 1985: Kyösti Varis
Norden signature 2005: Due design AS



norden

NordForsk

"NordForsk sees it as important to participate in the modernisation process wherever we have a relevant role and to help to make Nordic cooperation known and more visible both for its research and in general."

Telling the Nordic story together

It is not just Nordic residents who view the Nordic region and Nordic values as something special. The individual countries are small and have certain national differences, but due to their similar governance models, shared values, and common history and cultural heritage they attract the attention of the rest of the world and are often perceived as a unit. Interest in the Nordic region is on the rise, both in terms of the unique cooperation and the solutions that the countries share.

"For example, there is great interest in our model of gender equality where women play a greater role in the labour market, pay taxes and contribute to the welfare society," the Secretary General states.

The Nordic prime ministers and ministers for co-operation place great emphasis on the vision declaration *Together We Are Stronger*, and they wish to promote the Nordic region as a joint brand. It is important to strengthen the region in international contexts, but it is also important to share Nordic successes and achievements with the rest of the world. Based on this, a project has been initiated to build and reinforce the Nordic brand.

"The renewal of the Nordic family is linked to building the brand, and here our research collaboration clearly has a role to play," states Dagfinn Høybråten. "What we see at the Council of Ministers Secretariat, and what NordForsk itself experiences, is that joint funding of research is very successful. Nordic research cooperation is definitely one of the strengths we will continue to build on, and it gives us greater impact in arenas where, individually, national projects would have been more limited. At the same time, there is always something that can be improved upon, such as how we prioritise thematic areas and funding.

New logo 2016: Bo Linnemann/Kontrapunkt



NordForsk

Dark blue

pantone: 294 U
CMYK: 100 - 55 - 3 - 25
RGB: 56 - 89 - 136
HEX: 385988

Primary Blue

pantone: 300 U
CMYK: 100 - 40 - 0 - 6
RGB: 0 - 110 - 182
HEX: 006eb6

MODERNISING NORDIC COOPERATION

In June 2014, the Nordic Ministers for Co-operation adopted a reform package, entitled the *New Nordic Region*, with the aim of modernising Nordic cooperation. The objective of the reform has been to expand the political content of Nordic cooperation, with a focus on current topics. In September 2016, the follow-up report *Nordens tid er nu* (The time for the Nordic region is now) was issued. This report outlines the next phase of the modernisation effort, where profiling the Nordic region is one of the elements.

NEW DESIGN

The Nordic family with the Nordic Council of Ministers, including its institutions, information offices, a large number of programmes and activities as well as the Nordic Council are introducing a new visual profile beginning in November 2016.

Yellow

pantone: 7404 U
CMYK: 0 - 13 - 100 - 0
RGB: 253 - 207 - 65
HEX: fdcf41

BRANDING THE NORDIC REGION

The Nordic Perspective – Strategy for International Branding of the Nordic region is a strategy for building up the region as a brand, developed from the vision declaration for the Nordic region, “Together We Are Stronger”.

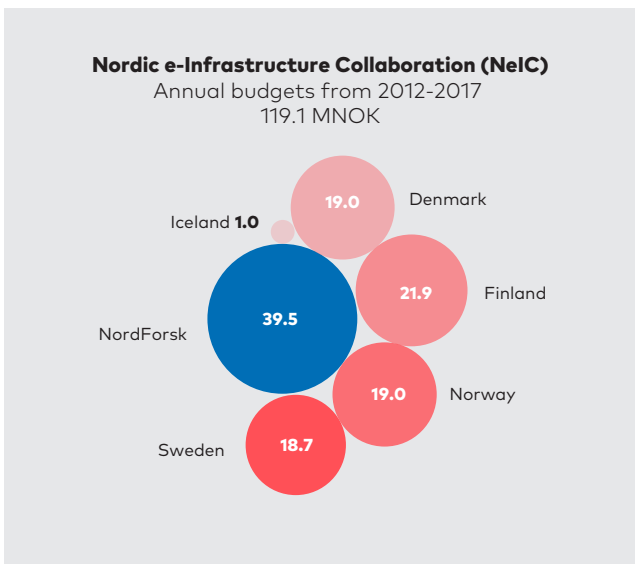
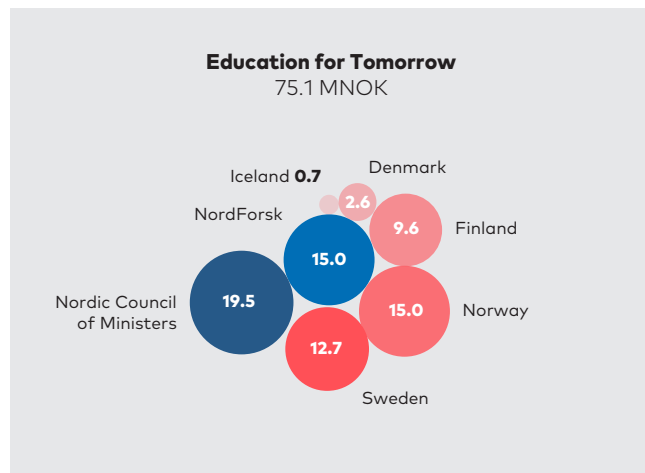
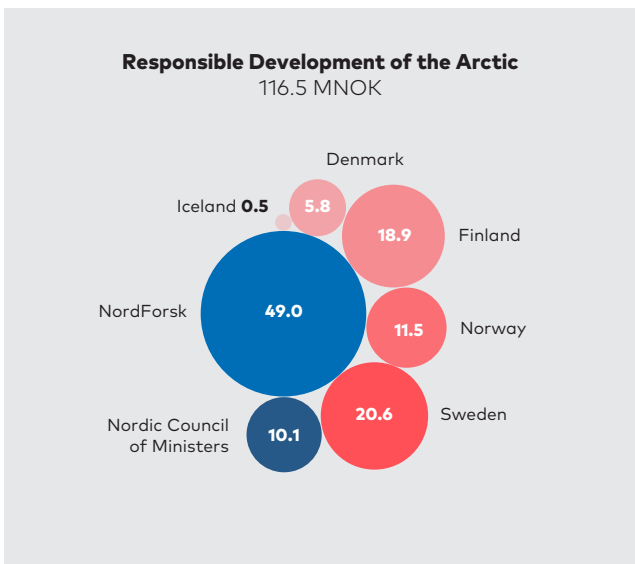
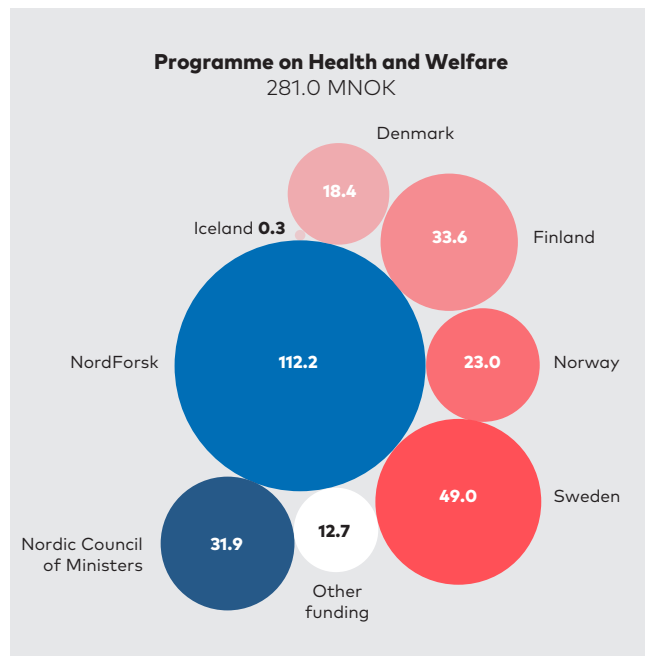
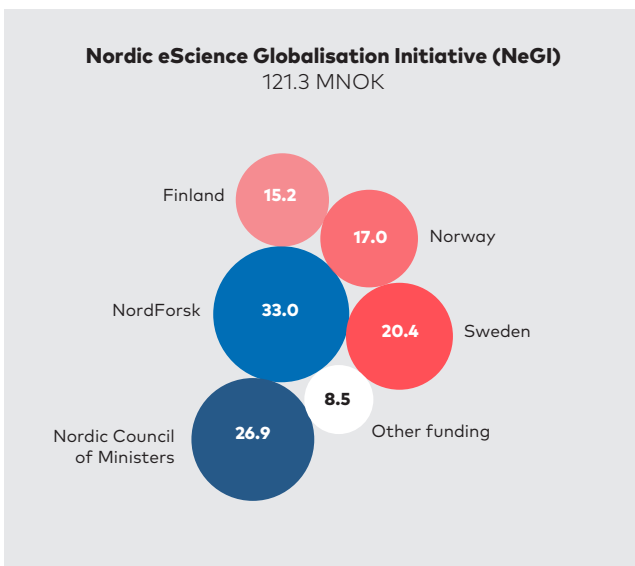
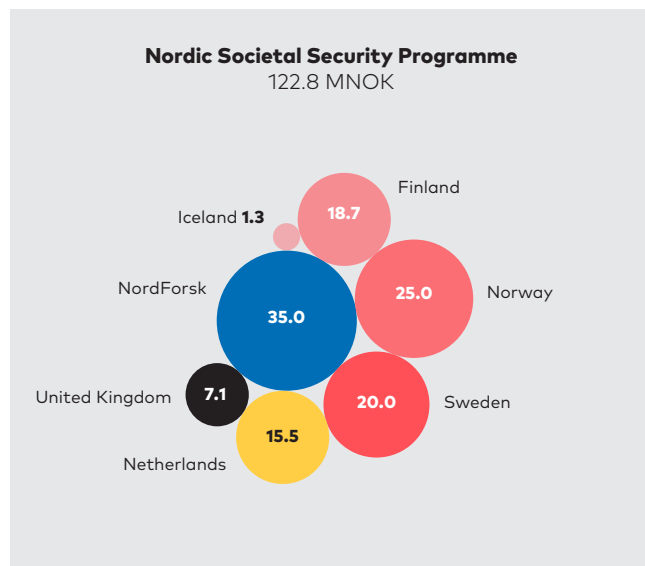
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HEX: ef403b

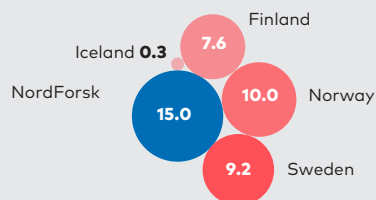


FACTS & FIGURES

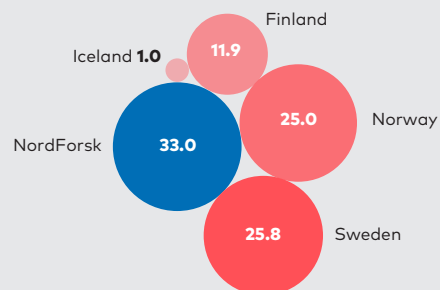
Larger active common pot initiatives.



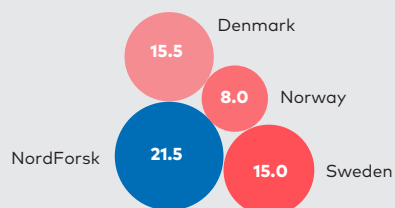
Gender in the Nordic Research and Innovation Area
42.1 MNOK



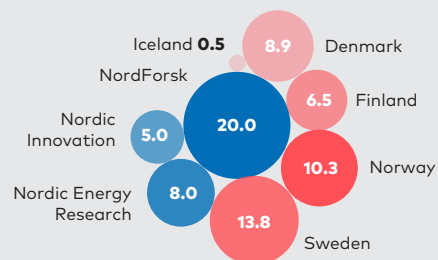
Bioeconomy Programme
93.7 MNOK



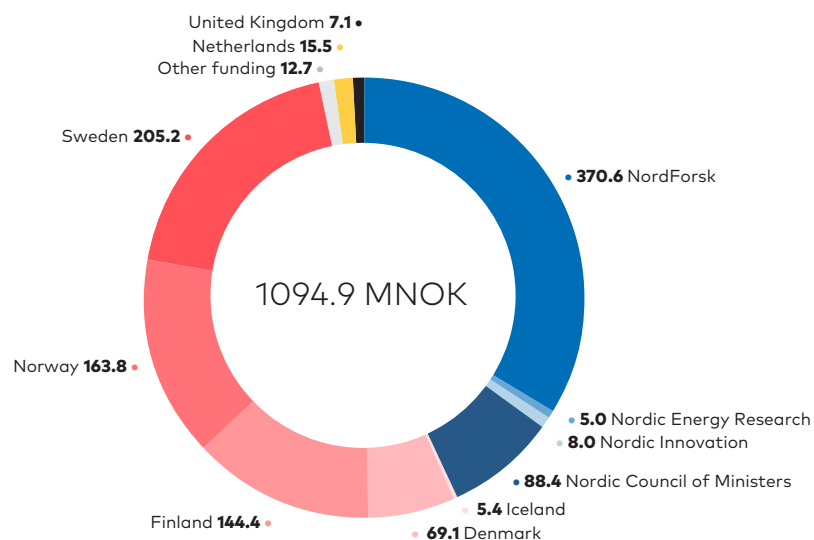
Neutron Science Programme
59.0 MNOK



Green Growth Research and Innovation Programme
73.0 MNOK



**Total of all active common
pot initiatives**



STAY UP-TO-DATE ON OUR CALLS FOR PROPOSALS

Research funding from NordForsk must be sought via its open funding announcements. NordForsk does not offer direct grants, fellowships or other permanent funding schemes, but issues calls for proposals regularly under its thematic research programmes. Our research programmes are multi-disciplinary, so we recommend looking at all our funding announcements, which can range from 10–20 each year. **Funding is announced through a variety of channels, so find the one that is best for you.**

NORDFORSK'S OFFICIAL WEBSITE: NORDFORSK.ORG

Calls for proposals and pre-announcements are listed on the front page and are available under the menu item "Apply for funding". We also publish news briefs on the website whenever a call is issued.

E-MAIL NEWSLETTERS

Newsletters are sent whenever news items, including funding announcements, are published. Subscribers receive information about funding announcements and a low volume of other news. Typically you will receive one news item per week. It is possible to subscribe to the newsletters on the front page of nordforsk.org.

TWITTER, FACEBOOK AND LINKEDIN

Stay up-to-date on new calls for proposals and other information related to NordForsk's activity by following us via one of these social media:

Facebook: facebook.com/NordForsk

Twitter: @NordForsk

LinkedIn: linkedin.com/company/nordforsk

RSS

Calls for proposals are published as RSS feeds via our website. Using an RSS reader you can subscribe to an RSS feed dedicated exclusively to calls:
nordforsk.org/en/funding/calls-for-proposal/rss.xml

THE NORDFORSK CALL AND APPLICATION PORTAL

To apply for funding, you must use the NordForsk Call and Application Portal (funding.nordforsk.org) for the submission and administration of your application. While you can always find open calls for proposals in the Call and Application Portal, please note that pre-announcements are not published there. Even if you check the portal regularly it is recommended that you follow along via one of the other channels mentioned.

NordForsk is an institution under the Nordic Council of Ministers that facilitates and provides funding for Nordic research and research infrastructure cooperation.



NordForsk

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