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Nordic Council of Ministers

# Health Innovation in the Nordic countries



Health Innovation in the Nordic Countries  
Public Private Collaboration

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**Nordic co-operation**

*Nordic cooperation* is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and three autonomous areas: the Faroe Islands, Greenland, and Åland.

*Nordic cooperation* has firm traditions in politics, the economy, and culture. It plays an important role in European and

international collaboration, and aims at creating a strong Nordic community in a strong Europe.

*Nordic cooperation* seeks to safeguard Nordic and regional interests and principles in the global community. Common Nordic values help the region solidify its position as one of the world's most innovative and competitive.



# Health Innovation in the Nordic countries

– Public Private Collaboration



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# 1 Preface

We are witnessing a growing global demand for health care solutions. In other words, there is an important global market for Nordic companies specialized in health care solutions. How can this potential be released? And how can public-private collaboration in the health sector promote innovation and a global competitive Nordic health sector? These are two of the questions the Nordic Ministers for Business Affairs have put on the agenda.

Public-private collaboration holds great potentials for both the public and the private sector. The need for better and more efficient health care solutions is global, which is why this is an area with a substantial business potential. The public sector constitutes a large proportion of the Nordic health care services. Therefore, there are many benefits in using public-private interaction strategically to strengthen competitiveness in the private sector and develop new solutions for the public health sector.

Many of the Nordic countries have already taken important steps such as the Public Welfare Technology Foundation and the Business Innovation Fund in Denmark. The Nordic countries share many similarities and Nordic collaboration on better frameworks for public-private collaboration on innovation holds an important potential. Therefore, the Nordic Ministers for Business Affairs have put public-private collaboration on the agenda. This report presents a study on public-private collaboration in the Nordic health sector and suggests new policy recommendations for future initiatives and actions at national level and across the Nordic countries.

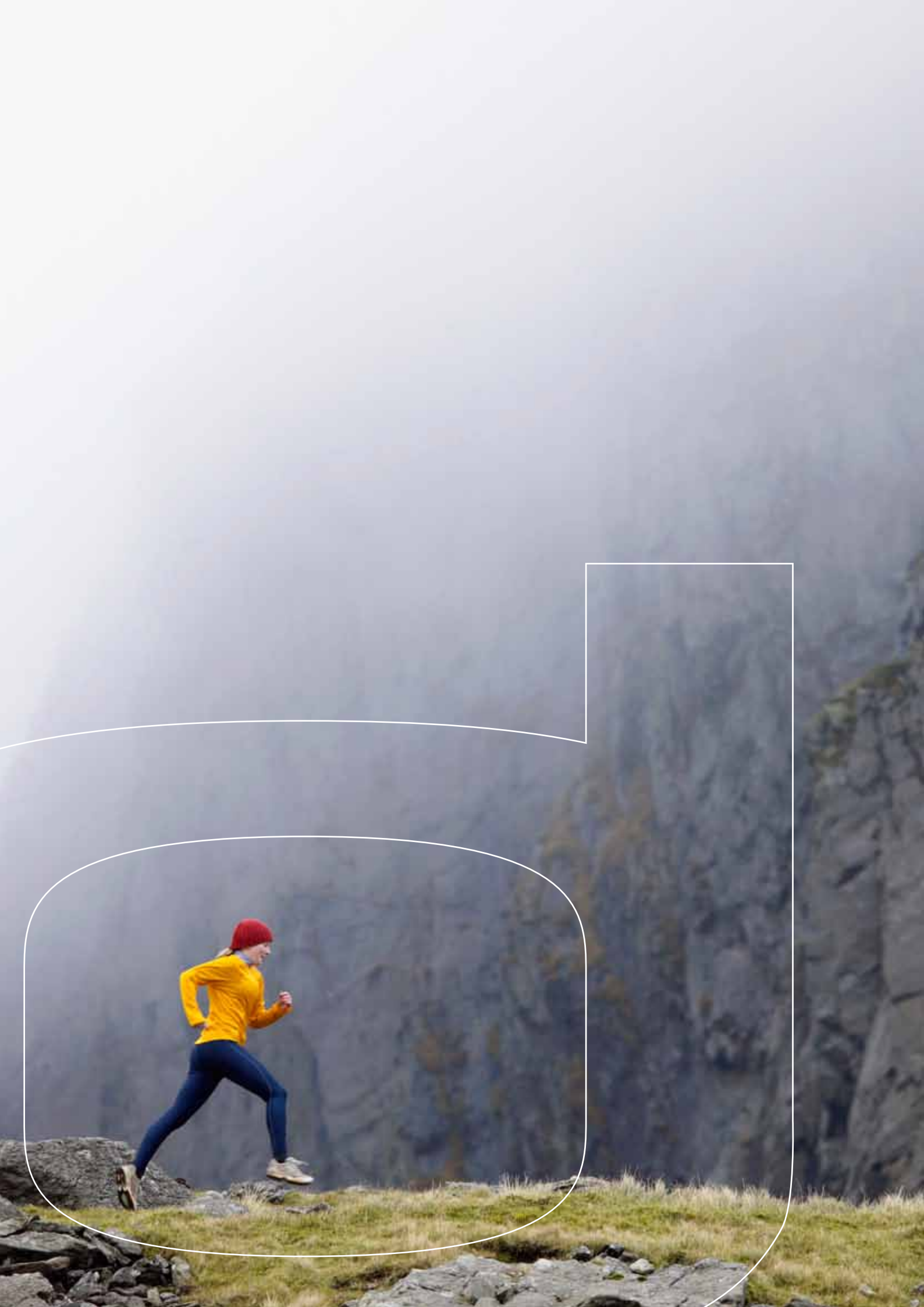
The report has been prepared by the Nordic consultants DAMVAD, Econ Pöyry and Oslo Economics for the meeting of the Nordic Council of Ministers in October 2010, and the conclusions are those of the authors. However, I am convinced that the study will be useful in our future work towards improving the Nordic conditions for innovation and creating better services in the health sector.



Brian Mikkelsen

Minister for Economic and Business Affairs

Copenhagen 22 September 2010



## 2 Executive summary

Innovation in the health care sector and public private collaboration are high up on the political agenda in the Nordic countries. Numerous positive initiatives are taken to strengthen the activities through clear strategies and policy measures. However, there is still untapped potential.

The Nordic countries have major business strongholds in the health industry. The strongest and most developed industries are to be found in the areas of pharmaceutical, biotechnological and medical technology in Denmark and Sweden. But Norway, Finland and Iceland also have interesting and growing health industry segments.

### 2.1 Mapping of the Nordic health sector

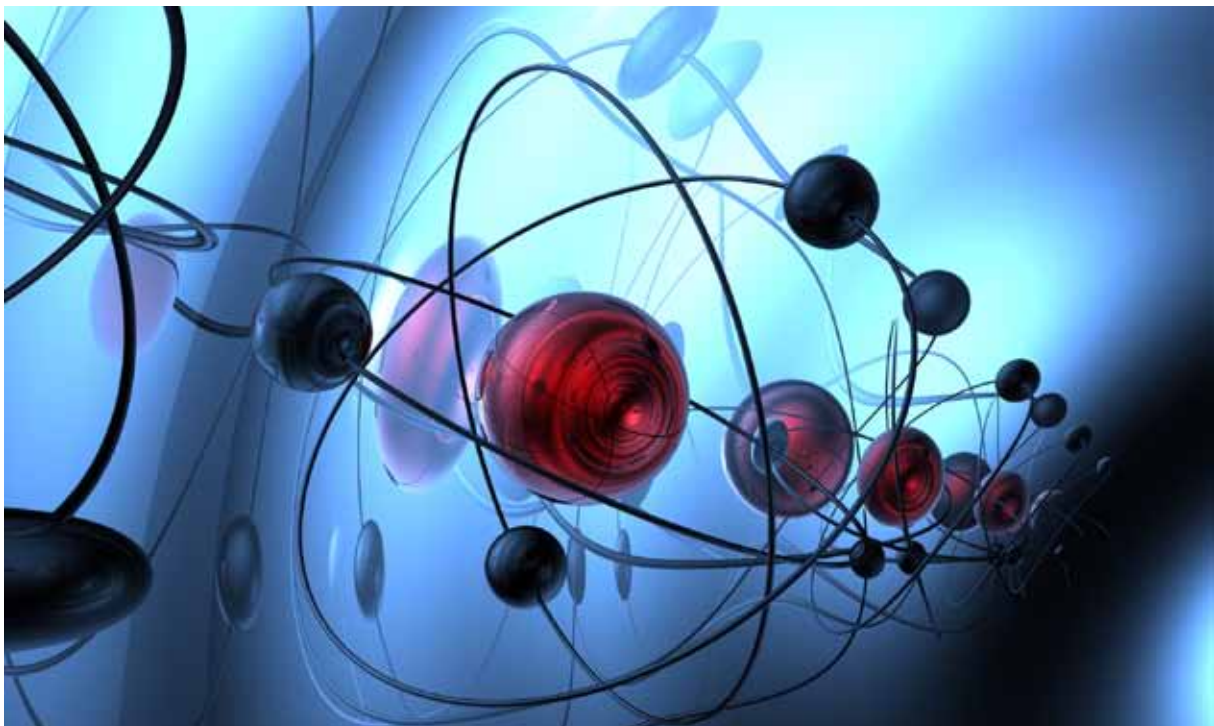
The Nordic countries, except Finland, have a higher health spending per capita than the OECD average, and 80 to 85 percent of health spending is funded by public sources. Like the rest of the OECD countries, the Nordic countries have experienced an increase in their expenditure on health per capita since the late 1990's, with Norway seeing the highest increase in health spending.

According to OECD health data, the total Nordic market for health solutions amounted to USD 89 billion in 2007, including both public and private expenditures on health solutions. For 2010, expenditures are projected to reach USD 103 billion indicating the vast market opportunities that exist for companies in the Nordic health industry.

### 2.2 Health innovation across the Nordic countries

The study shows a high degree of similarity between the Nordic countries when it comes to the public private collaboration on innovation and barriers to stimulating development of innovative solutions in the health care sector.

Public procurement is, to a large extent, used for procurements of standard products and solutions. None of the countries however indicate having any further experience of pre-commercial procurement. There is an increasing focus on public private collaboration on innovation. Most of the public private collaboration projects take place either on a regional or a national level, with the exception of Iceland



which has an international perspective. Target markets for innovations are mostly national markets, again except for Iceland, explained by the fact that the innovations are considered only to be relevant in a local context and, to some extent, that there are barriers towards entering the Nordic market. The report also shows that public private collaboration is a major driver of entrepreneurship within the health area. Many new companies emerge from collaborations as spin-offs or as a result of the interaction.

Barriers to innovation and public private collaboration are to a large extent inter-Nordic. The most common barriers are:

- Perception of lack of flexibility in regulations, e.g. public procurement regulations, due to inadequate knowledge
- Inadequate economic conditions e.g. lack of private venture capital, lack of policy measures to stimulate private investments in innovation and lack of support systems to enhance public private collaboration
- Cultural barriers and lack of trust between the traditional public health care sector and private sector business
- Lack of knowledge-sharing across the countries and a high degree of national-oriented mind-set
- Complexity and costs related to standards

## 2.3 Policy recommendations

There is a huge potential for health innovation in the Nordic countries, which could place the Nordic region among the leading competitive regions in the world within health solutions while at the same time enhancing quality and effectiveness in the public health sector. This calls for action and increased interconnectedness between the private and the public sector. We propose to strengthen the public procurement and the Nordic health innovation systems!

In the Nordic countries, where the public sector constitutes such a large part of the market for health innovation, it is imperative to develop a competitive edge that the public sector participates in. It is necessary to make public procurement an active part of the innovation system. And it is essential that the public sector expands the use of pre-commercial procurement.

Furthermore, there are several ways to strengthen the conditions for public private collaboration on health innovation. We propose to strengthen the Nordic health innovation system by linking the funding opportunities and the actors together in order to build on existing structures, and opening up a Nordic arena for health innovation. Finally, there are measures which could be taken on a national level. Across the Nordic countries we can identify examples of new initiatives. On a national level we propose to implement demand for innovative solutions in the public health sector. Furthermore, we propose that political measures to strengthen health innovation have a strong focus on commercialisation.

## 3 Sammenfatning

Innovasjon i helsesektoren og offentlig privat samarbeid står i fokus i Norden. En rekke positive initiativer er tatt for å styrke aktivitetene, gjennom eksplisitte strategier, virkemidler, etablering av organisasjoner rettet mot kommersialisering av forskningsbasert innovasjon og utvikling av nettverk for å styrke samspillet mellom ulike interessenter. Likevel er det et uutnyttet potensial i økt nordisk samarbeid.

### 3.1 Kartlegging av den nordiske helse- og omsorgssektoren

De nordiske landene, bortsett fra Finland, har høyere helseutgifter per innbygger enn OECD-gjennomsnittet. Om lag 80 til 85 prosent av helseutgifter er offentlig finansiert. Som resten av OECD-landene har de nordiske landene, særlig Norge, hatt en økning i helseutgiftene per innbygger siden slutten av 1990-tallet.

De nordiske landene har sterke næringsmiljøer innenfor helseindustri. De sterkeste og mest utviklede miljøene er å finne i områder med farmasøytisk industri, bioteknologisk og medisinsk teknologi i Danmark og Sverige. Norge, Finland og Island har også interessante og voksende næringsmiljøer. Sverige har høyest omsetningsverdi og sysselsetting i helseindustrien, tett fulgt av Danmark. Imidlertid finner vi de mest produktive selskapene, målt ved brutto salgsverdi per sysselsatt, innen basic medicines i Norge og i farmasøytisk industri i Sverige.

### 3.2 Helseinnovasjon i Norden

Studien viser høy grad av likhet mellom de nordiske landene når det gjelder offentlig-privat samarbeid om innovasjon og barrierer for å stimulere utvikling av innovative løsninger i helsesektoren.

Offentlige anskaffelser brukes i stor grad for kjøp av standardprodukter og løsninger. Ingen av landene synes å ha omfattende erfaring med pre-kommersielle anskaffelser og offentlig-privat samarbeid om innovasjonsprosjekter. Likevel er det et økt fokus på denne typen samarbeid. De fleste av de offentlige-private samarbeidsprosjektene om innovasjon som finner sted, skjer enten på et regionalt eller et nasjonalt nivå, bortsett fra på Island. Markeder for innovasjonene er for det meste nasjonale markeder, igjen bortsett fra Island. Dette forklares med at innovasjonene anses å være relevante i en lokal kontekst og til en viss grad at det oppfattes å være inngangsbarrierer i det nordiske markedet.

Barrierer for innovasjon og offentlig-privat samarbeid er i stor grad felles nordisk. De viktigste barrierene synes å være:

- Mangel på fleksibilitet i (tolkning av) lover og forskrifter, for eksempel regelverket for offentlige anskaffelser
- Begrenset tilgang på finansiering, for eksempel mangelen på privat såkornkapital, mangel på virkemidler for å stimulere private investeringer i nyskaping og mangel på finansierungsordninger som styrker offentlig privat samarbeid nasjonalt og nordisk
- Kulturelle barrierer og mangel på tillit mellom tradisjonell offentlig helse -og omsorgssektor og privat sektor
- Mangel på utveksling av kunnskap på tvers av de nordiske landene og høy grad av nasjonal orientering
- Kompleksitet i standarder og kostnader knyttet til å tilfredsstille standarder

### 3.3 Politikk anbefalinger

Det er et stort potensial for helseinnovasjon i de nordiske landene. Dersom vi klarer å utnytte dette kan Norden framstå som en ledende, konkurransedyktig region innen helseløsninger samtidig som vi styrke kvalitet og effektivitet i helsevesenet. Dette krever handling og økt samhandling mellom privat og offentlig sektor. Vi foreslår å endre tenkingen omkring offentlige anskaffelser og de nordiske landenes helseinnovasjonssystemer.

Fordi offentlig sektor i de nordiske landene utgjør en så stor del av markedet for helseinnovasjoner, er det avgjørende at sektoren deltar for å utvikle konkurransefortrinn. Vi må styrke vilkårene for offentlig privat samarbeid om helseinnovasjon. Det er nødvendig å gjøre offentlige anskaffelser til en aktiv del av innovasjonssystemet. Helsevesenet må etterspørre innovative løsninger. Og det er nødvendig at offentlig sektor utvider bruken av pre-kommersielle anskaffelser.

Vi foreslår å endre det nordiske helseinnovasjonssystemet ved bedre å koble finansieringsmuligheter og aktører. Utviklingen må bygge på eksisterende strukturer, men åpne for en nordisk arena for helseinnovasjon. I tillegg er det behov for tiltak på nasjonalt nivå basert på læring mellom landene. Det er særlig viktig at politiske tiltak for å styrke helseinnovasjon har et sterkt fokus på kommersialisering.



# 4 Introduction

## 4.1 The Nordic Health system needs innovation

Spending on health care has grown by 2 percentage points in excess of GDP growth across all OECD countries over the last 50 years. As a result, health care has become a much bigger part of most national economies. If this development continues, health care will consume a larger proportion of the advanced economies' wealth, and in 2050 most OECD countries stand to spend more than a fifth of their GDP on health care.<sup>1</sup>

In the Nordic countries, the development poses a major challenge in terms of increasing financial pressure on the health care sector. On the other hand, it also implies that there is a growing global market for health care solutions for innovative companies. In the Nordic countries, health care is dominated by the public sector. The public and the private sector are therefore deeply interdependent if the business potential is to be exploited and the health care service improved.

The Nordic health care systems are, in many ways, very alike. The main part of health care services is provided by the public sector and financed by taxpayers. Universities that are managed and financed by the state together with university hospitals have the main responsibility for health research.

The increased demand for health care therefore presents a challenge for financing the health care system in the Nordic Countries. Care-demanding elderly will increase both in numbers and in the share of the population compared to the work force. This will make it harder to finance through taxes. The combined challenges of rising health care costs, demographic challenges and more people with chronic diseases will certainly require innovation in the health care systems of the Nordic countries.<sup>2</sup>

There is a need to optimize the individual's 'health life cycle' from promoting healthy living, to preventing diseases and to optimising the use of resources in primary care, hospitals and medical clinics; to reduce costs related to rehabilitation through home care and improve diagnostic and rehab processes through technology. There is a need to find smarter ways to save money and increase the health output of the health system. New health care services and technology can

be a part of the solution to deliver still improved health care more efficiently. Furthermore, the global growth in health care expenditures also reflects a growing market for health care solutions and potential for economic growth.

On this basis, the report studies how to promote innovation and entrepreneurship, encourage good and effective public private partnerships in the Nordic countries, and how to exploit best practice in the Nordic countries to improve innovation systems in the health sector.

## 4.2 Public private collaboration is the key

Public private collaboration can help solve challenges in the public health sector, through the development of better and cheaper products and solutions. It gives the opportunity to strengthen organisation, work practices, creativity and innovation. For private companies, collaboration can provide access to knowledge about user needs and the health care sector, which is necessary for developing new technologies and services to be sold domestically and in foreign markets, and it opens the public sector as a market for the supplying companies. Furthermore public private collaboration can be the starting point for entrepreneurs launching new products and companies. In this way the public sector can also function as a driver for the private health industry.

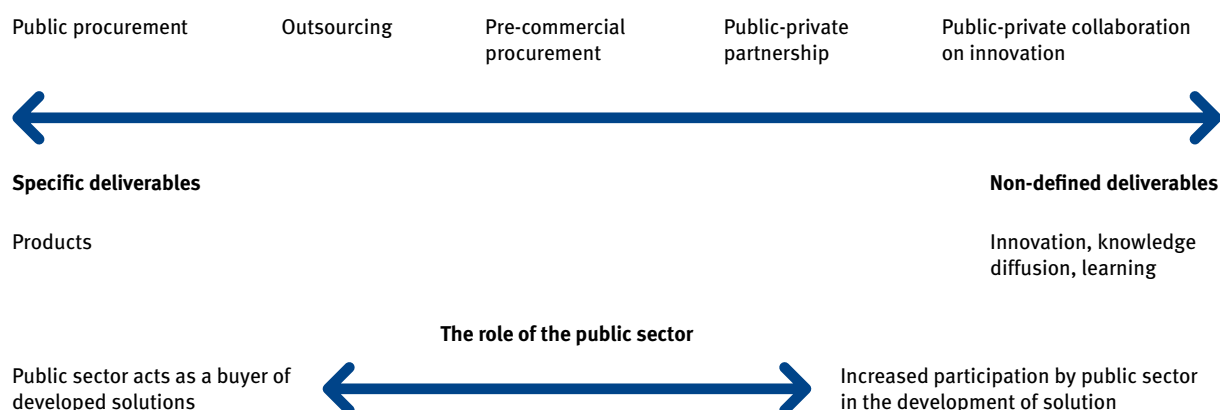
The analysis examines the many different ways public and private actors can collaborate in order to discover barriers, potential and practises. Figure 4.1 illustrates five different types of public private collaboration, which differentiate themselves by the degree of specified deliverable and purpose of the collaboration.<sup>3</sup> These types cover many variations of public private collaboration, and will often be inter-related and take different forms over time. Public private collaboration on innovation often results in new products to be purchased in later stages and well established commercial relationship can result in entrepreneurial spin-offs.

1) McKinsey (2008): Health care cost. A market based view.

2) Innovation Center Denmark, Silicon Valley (2010): The future of health innovation project.

3) DI (2010): Offentlig-privat samarbejde.

#### 4.1 Five types of public private collaboration



*Public procurement* is mainly defined as the acquisition of products or services by a public institution through the use of e.g. tenders, bids, etc. It is primarily more standardised products and solutions that this type of collaboration deals with.

*Outsourcing* is defined as contracting out a function or business area to a private company, e.g. cleaning services, operation of nursery homes, etc. Outsourcing opens for more variations on delivery than procurement, since the contractor can choose to organise the delivery in many different ways. Public procurement and outsourcing are among the most common ways of public private collaboration.

*Pre-commercial procurement* is when public authorities act as the demanding first buyer. It includes procuring R&D services, which involves risk-benefit sharing and developing new solutions as part of the process. Pre-commercial procurement is only used on a limited basis, which is why the EU has urged countries to take action.<sup>4</sup>

*Public private partnership* is defined as a contract where a private actor has responsibility for the entire span of tasks in a project, including the design, financing, construction, operation, maintenance and service. There exist only limited international experiences with this collaboration, and mainly within construction.<sup>5</sup>

*Public private collaboration on innovation* consists of a close cooperation for developing solutions for the public sector. The participants exchange ideas and knowledge, but the immediate objective is not the purchase of a new product or solution. There is limited literature on this collaboration

type, but recent analysis suggests that this type of collaboration is becoming more common.

In this analysis, the main focus is on procurement, pre-commercial procurement and public private collaboration on innovation, with outsourcing included as a dimension under procurement. There are only few international examples of public private partnerships, mainly within construction, while outsourcing is in many ways treated as procurement by the public procurement departments.

##### 4.2.1 Innovation and entrepreneurship

The public sector is often seen as a potential driver for innovation and entrepreneurship. An important topic for this analysis is therefore how public private collaboration can strengthen innovation and entrepreneurship in the health sector. The report thus focuses on the potential and consequences for entrepreneurs that are part of public private collaboration.

The understanding of innovation is in this report based on the definition by the OECD and the EU: “...the implementation of a new or significantly improved product (good or service), or process, a new marketing method or a new organisational method in business practices, work-place organisation or external relations.”

Innovation can be based on several different approaches at the same time. Research-driven innovation involves new knowledge from universities or other scientific arenas, e.g. new knowledge of technology, scientific experiments etc. This is often very early in the technology development

4) European Commission (2008): Pre-commercial procurement.

5) Christensen & Petersen (2010): Reguleringen af udlicitering og offentlig-private partnerskaber (OPP) i de danske kommuner in *Politica* June 2010.

phase. User-driven innovation is when new products and processes are developed based on knowledge of recognised (through e.g. market analyses, focus groups etc.) and unrecognised needs (observations, ethnographical methods, prototype testing, lead user methods, participatory design etc.) among users and in markets.

Innovation can be research-driven to a greater or lesser extent. At the same time, it can be more or less user-driven. It is simplistic to say that users are not involved in research-driven innovation processes or that universities are not involved in user-driven innovation. The analysis focuses on user-driven innovation.

Entrepreneurship is widely recognised as one of the main drivers for growth. Entrepreneurship consists of establishment of new companies. This can be in the form of spin-offs or when private actors approach the public sector with an idea that needs collaboration from the public partner to be commercialised. Furthermore, the public sector can be an important customer for new companies.

#### **4.2.2 Health innovation and health care**

Health innovation is widely recognized as a complex process working through interdependent systems, institutions and

with many actors affecting the outcome. However, health innovation is often treated as a black box. There is a need for more knowledge of what is happening in the processes when positive change is accomplished or when no change is happening.

Although the number of studies of innovation processes has increased greatly over the last 15 years, our knowledge about the conditions for the successful implementation of innovations in health care organisations and the health industry is still very limited.

This report uses a broad definition of health care, to include products, services and solutions. This implies that health innovation covers technology, as well as new ways of delivering and organising services.

In the broadest sense, the health industry comprises providers of diagnostic, preventive, remedial, and therapeutic services such as doctors, nurses, hospitals and other private, public, and voluntary organisations. It also includes medical equipment and pharmaceutical manufacturers and health insurance firms.

The term health industry in this study emphasises the private sectors that produces health care equipment and



services, as well as pharmaceuticals, biotechnology and life sciences. The sectors associated with these groups are: biotechnology, diagnostic substances, drug delivery, drug manufacturers, medical equipment and instruments, diagnostic laboratories, nursing homes, providers of health care plans and home health care.

### 4.3 Approach

This analysis in all five Nordic countries represents new territory to be discovered, which implies a lack of knowledge and comparable data sources. The report is therefore based on information from different sources.

The analysis includes a mapping of the health sector in the Nordic countries. This part of the analysis is based mainly on the extraction of comparative statistical data from international databases.

The major part of the study is based on extracting learning points from best practice examples in all five Nordic countries. In each Nordic country 3 in-depth case studies have been conducted based on interviews with private and public actors. The case studies have been selected through desk research, extensive dialogue with experts in all 5 countries, as well as the members of the Nordic Council of Ministers' task force for innovation and entrepreneurship in the health sector.

Furthermore, the case studies have been selected with the aim of highlighting four different types of innovative health solutions to demonstrate the large span of health solutions in the health sector, and to focus on three main areas. The cases should highlight four types of solutions. The cases therefore cover ICT, services, medical technique and bio medicine as different types of solutions to focus on for specific public private collaborations.

Furthermore, these cases have been selected to focus on the role of public procurement, public private collaboration on innovation and entrepreneurship in the collaboration projects. The cases selected are presented in the chart below.

In each country workshops have been conducted with private and public actors – companies, authorities, public service providers and interest organisations. The purpose of the workshops has been to anchor the topic in each country and discuss the political implications with the stakeholders.

A survey has been conducted across the Nordic countries. The survey is not intended to be a representative survey, but is aimed at practitioners with a high degree of experience of public private collaboration within the health care sector. The aim of the survey is to qualify the findings from the case studies and workshops with more standardised and comparable data from actors within this field.

### 4.2 Overview of cases

| Country | Case                           | Solution |          |                |               | Focus                                      |                    |                  |
|---------|--------------------------------|----------|----------|----------------|---------------|--------------------------------------------|--------------------|------------------|
|         |                                | ICT      | Services | Med. technique | Bio. medicine | Public private collaboration of innovation | Public Procurement | Entrepreneurship |
| Finland | Helsinki entrepreneurs         |          | X        |                |               |                                            | X                  | X                |
|         | Kotitori home services         |          | X        |                |               | X                                          | X                  | X                |
|         | Caring TV                      | X        | X        | X              |               | X                                          |                    | X                |
| Sweden  | MobiPen                        | X        | X        | X              |               | X                                          |                    | X                |
|         | NeoDynamic                     |          |          | X              |               | X                                          |                    |                  |
|         | New tools for health           |          |          |                | X             | X                                          |                    |                  |
| Norway  | KOLS Heim                      | X        | X        | X              | X             | X                                          |                    | X                |
|         | Hospital IT                    | X        | X        |                |               | X                                          |                    |                  |
|         | Oslo Cancer Cluster            |          |          | X              | X             | X                                          |                    |                  |
| Iceland | Björkin                        |          | X        |                |               | X                                          |                    | X                |
|         | Nox Medical                    | X        |          | X              |               | X                                          |                    | X                |
|         | Mentis Cura                    | X        | X        |                |               | X                                          |                    | X                |
| Denmark | Bathrooms for everyone         |          |          | X              |               | X                                          |                    |                  |
|         | iHospital                      | X        |          | X              |               | X                                          |                    | X                |
|         | Medical Services of the Future |          | X        |                |               | X                                          |                    |                  |

## 5 Mapping of the Nordic Health sector

This chapter delivers an introductory mapping of the market of the health sector within the Nordic countries. On the basis of existing studies, reports and statistical data the mapping illustrated developments in the Nordic countries' total spending on health per capita. The mapping describes the existing health care industry and business strongholds in the Nordic region. Finally, we map the Nordic health care industries in terms of turnover, employment performance and productivity.

The mapping shows that all the Nordic countries, except Finland, have a higher health spending per capita than the OECD average. We also learn that in all the Nordic countries, except for Finland, between 80 and 85 percent of health spending was funded by public sources. All the Nordic countries have seen increases in their expenditures on health per capita since 1998, with Norway representing a higher increase in health spending than the other Nordic countries.

The mapping further shows that all the countries have obtained major business strongholds in the health industry. The strongest and most developed industries are found in the areas of pharmaceutical, biotechnological and medical technology in Denmark and Sweden. But Norway, Finland

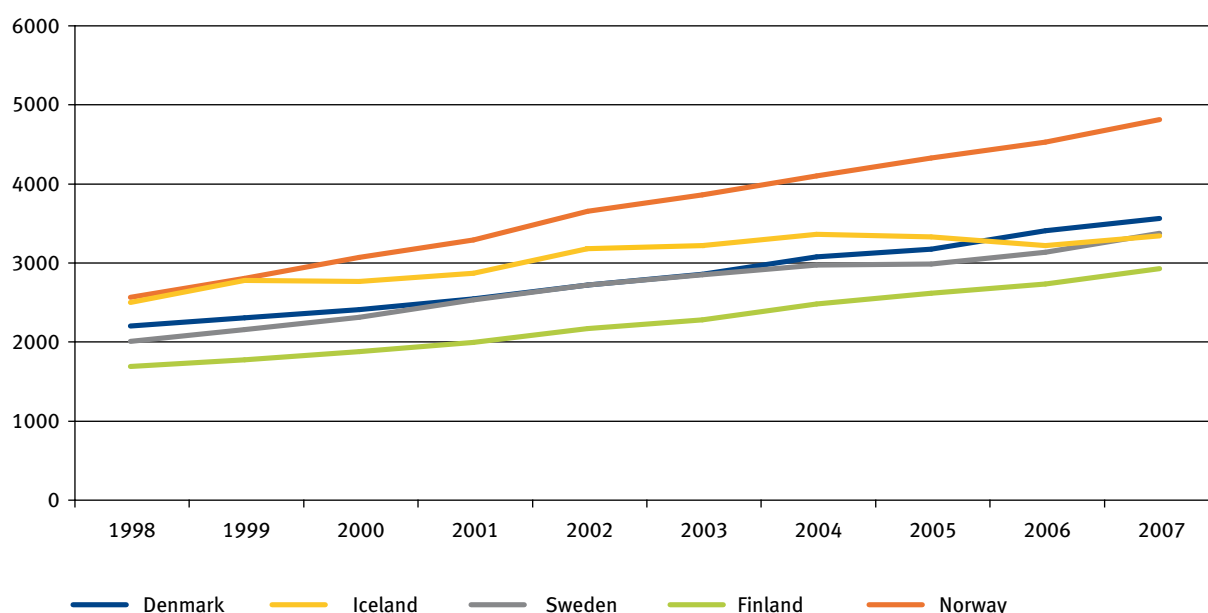
and Iceland also have interesting and growing health industry segments.

### 5.1 Nordic health care spending

In terms of health spending per capita, Norway ranked the second highest among OECD countries in 2008 (after the United States), with a spending of 5,003 USD (adjusted for purchasing power parity), which is well above the OECD average of 3,060 USD. Denmark, Sweden and Iceland also ranked above the OECD average in terms of total health spending per capita, with current spending of 3,540, 3,470 and 3,359 USD in 2007 or 2008 respectively. Finland, on the other hand, ranks slightly below the OECD average in terms of total health spending per capita, with a spending of 3,008 USD in 2008.

All the Nordic countries have seen increases in their expenditure on health per capita since 1998, with Norway representing a higher increase in health spending than the other Nordic countries.

Figure 5.1 Total expenditure on health per capita in the Nordic countries, 1998-2007



Source: OECD Health Data

Note: Measured by the US\$ purchasing power parity exchange rate.

The public sector is the main source of health funding in all the Nordic countries. In all the Nordic countries, except for Finland, between 80-85 percent of health spending was funded by public sources in 2007/2008, which is well above the OECD average (72.8 pct.). Finland is again noteworthy as it is more aligned with the OECD average. The developments in the public expenditure on health in the Nordic countries have been very stable between 1998 and 2007.

According to OECD health data, the total Nordic market for health solutions amounted to USD 89 billion in 2007, including both public and private expenditures on health solutions. When development in health expenditures from 2003 to 2007 is projected for 2010, the total Nordic health market reaches USD 103 billion. This indicates the vast market opportunities that exist for companies in the Nordic health industry.

## 5.2 Nordic health industry mapping

The term 'health industry' in this study accentuates the private sectors that produce health care equipment and services, not to mention the pharmaceuticals, biotechnology and life sciences. These include biotechnology, diagnostic substances, drug delivery, drug manufacturers, medical equipment and instruments, diagnostic laboratories, nursing homes, providers of health care plans, home health care, nutrition services, patient transportation, health insurance etc.

The mapping of the health industry in the Nordic countries is confined to the areas of welfare technology, pharmaceuticals, assistive technology, medico-technical equipment and automation and tele-communication for comparative statistical reasons. Service is mainly represented by ICT solutions, which forms part of the afore-mentioned areas. Here large parts of companies producing services as well as services establishment do not form part of the statistical mapping. The service industries and public private collaboration with regards to service innovation in the health care system are however part of the case studies.

### 5.2.1 Nordic health business strengths and strongholds

There are different strongholds within health in the Nordic region. An analysis of the relative importance of exports shows that there are various strongholds in the Nordic countries. The ratio indicating this is calculated in the following way: Exports of welfare technology divided by total export for the individual country. This is divided by the same calculation of welfare technology export share in the OECD countries. The ratio therefore illustrates the relative importance of a given area in the total export from one country compared to its importance on an international level.

In 2006 Iceland enjoyed absolute pole position within pharmaceuticals, while Denmark and Sweden were in the top

### 5.1 Export specialisation assistive technology 2006

| Rank | Country     | Export specialization |
|------|-------------|-----------------------|
| 1    | Iceland     | 81,01                 |
| 2    | Ireland     | 6,56                  |
| 3    | Switzerland | 5,48                  |
| 4    | Cyprus      | 4,47                  |
| 5    | Denmark     | 2,00                  |
| 6    | Sweden      | 1,06                  |
| 36   | Finland     | 0,15                  |
| 38   | Norway      | 0,08                  |

Source: Danish Enterprise and Construction Authority

### 5.2 Export specialisation pharmaceuticals 2006

| Rank | Country     | Export specialization |
|------|-------------|-----------------------|
| 1    | Iceland     | 12,67                 |
| 2    | Switzerland | 5,19                  |
| 3    | Ireland     | 4,03                  |
| 4    | Bulgaria    | 3,72                  |
| 5    | Cyprus      | 2,83                  |
| 7    | Denmark     | 1,92                  |
| 9    | Sweden      | 1,60                  |
| 26   | Finland     | 0,35                  |
| 34   | Norway      | 0,12                  |

Source: Danish Enterprise and Construction Authority

### 5.3 Export specialisation medico-technical equip. 2006

| Rank | Country     | Export specialization |
|------|-------------|-----------------------|
| 1    | Iceland     | 3,40                  |
| 2    | Ireland     | 1,98                  |
| 3    | Malta       | 1,96                  |
| 4    | USA         | 1,94                  |
| 5    | Netherlands | 1,50                  |
| 10   | Finland     | 1,23                  |
| 11   | Denmark     | 1,21                  |
| 13   | Sweden      | 0,91                  |
| 33   | Norway      | 0,16                  |

Source: Danish Enterprise and Construction Authority

### 5.4 Export specialisation automation and tele 2006

| Rank | Country        | Export specialization |
|------|----------------|-----------------------|
| 1    | Luxembourg     | 12,12                 |
| 2    | Ireland        | 6,24                  |
| 3    | Czech Republic | 3,26                  |
| 4    | Netherlands    | 2,21                  |
| 5    | Mexico         | 1,95                  |
| 9    | Sweden         | 1,46                  |
| 10   | Finland        | 1,13                  |
| 11   | Iceland        | 0,94                  |
| 18   | Denmark        | 0,36                  |
| 21   | Norway         | 0,31                  |

Source: Danish Enterprise and Construction Authority

10 in the OECD, a scenario that was mirrored in assistive technology. Iceland also tops medico-technical equipment. In this area we see that Finland has overtaken the position as number two in the Nordic countries. The ratio for Iceland is in all cases very high. This could be due to the fact that Iceland is a small country where just a few companies can have significant impact on the numbers. For example, Icelandic company Össur is a global leader in orthopaedics, which could explain the very high ranking within assistive technology.

Automation and tele-communication is the area, where the Nordic countries have the lowest international position. Within this type of product, Sweden, Finland and Iceland are in the lead in the Nordic countries, while Norway and Denmark lag behind.

It is important to note that these results were published prior to the financial crisis and may have changed dramatically due to weakened economies and a change in currency prices.

However, it does signify that within the Nordic countries there are competences present which can be build upon and potentials that can be further exploited.

Another way of looking at strongholds and potential in the Nordic countries is to focus on clusters where a lot of competence is already located.

Recent studies by Vinnova show that both Denmark and Sweden have major business strongholds in the pharmaceutical, biotechnological and medical technological industries (Vinnova 2007, 2008).

The most prominent regions in Sweden have differing profiles. Stockholm concentrates on drug discovery and development and has a strong presence of international pharmaceutical companies, which also often localise their sales and marketing activities in clinical trial operations there. Uppsala has several of the country's larger biotech tools and supplies companies, largely due to Pharmacia's previous activity in that region. Most new companies in this business segment have started up in Stockholm more recently, often as spin-offs from the Karolinska Institute and KTH. Strängnäs has some large bio-production plants and is often considered part of the Stockholm region.

The Gothenburg area has AstraZeneca's largest research unit in Sweden, and several larger medical technology companies. They include several companies involved in the development of oral cavity titanium implants, limb prostheses and bone-anchored hearing aids. The region has a large number of sales companies.

The most prominent region in Denmark is Medicon Valley, a bi-national cluster spanning the island of Zealand with the capital Copenhagen in eastern Denmark and the Skåne region of southern Sweden. Medicon Valley is one of Europe's

strongest life science clusters with over 43,500 employees in the life science industry. This is equal to 92 percent of all Danish plus 20 percent of all Swedish employees in companies with R&D and/or production and/or consultants, making the life science industry in this region of 3.5 million people region larger than in either of the two countries (Vinnova 2008)

In Norway 70 percent of all biotechnological research is done in the Oslo region. The research environment is closely connected to the medical, educational, business, and governmental infrastructure (Nortrade, Life science 2009).

Gaustadbekkdalen in Oslo is a concentrated physical campus for bio-medical activity. The stronghold is here the close cooperation between Rikshospitalet, the neighbouring University of Oslo. Also located here is a large division of SINTEF, the Nordic countries' largest independent applied research organisation, the Oslo Innovation Center and the GlaxoSmithKline Innovation Center. Not far from Gaustadbekkdalen, Montebello is home to the world famous Radium Cancer Hospital, with a new Radiation Centre, and a new science park to enhance the recently launched Oslo Cancer Cluster. To the South-East of Oslo, the Ås campus is the focal point of green and blue biotech research. As part of the biotech cluster, Oslo Cancer Cluster has received international recognition for its cancer research on treatment and diagnostics.

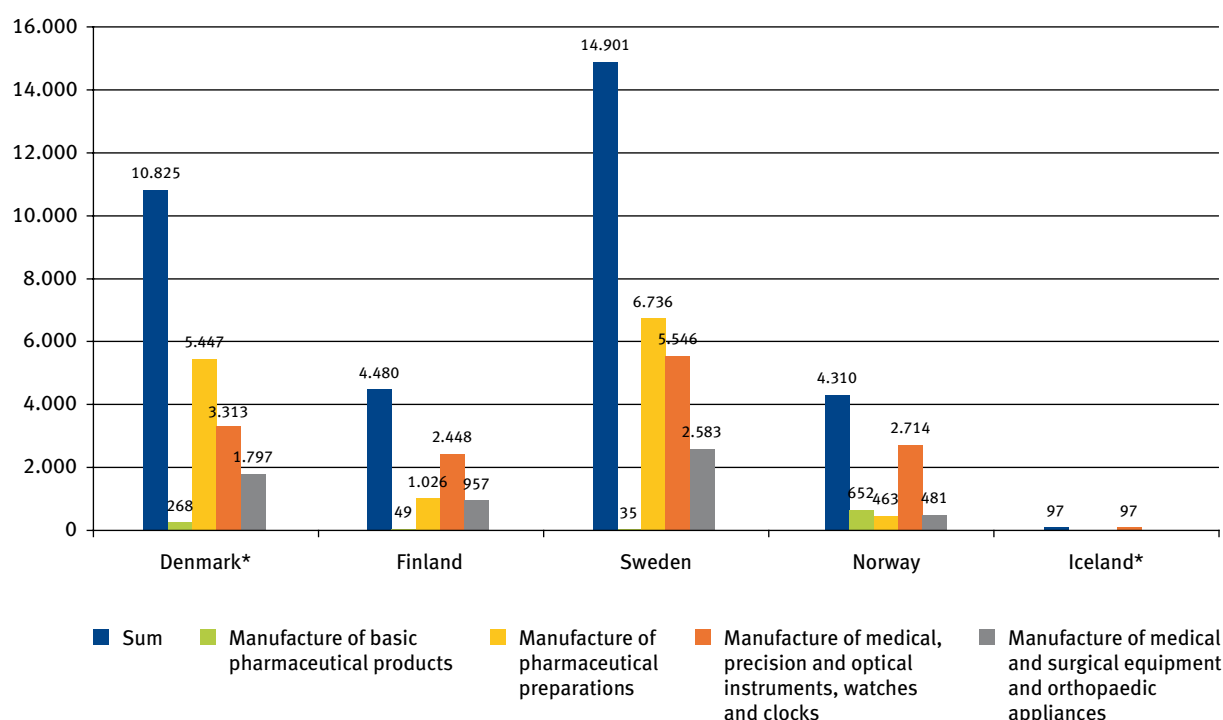
In Finland, the Turku Bio Valley is an initiative developed in response to the significant presence of the pharmaceutical industry, and biosciences in general in Finland. Public sector participation in this initiative is through centres of excellence and hospitals, while that of the private sector is through large Finnish pharmaceutical and biomedical enterprises.

Iceland, though small in size, is rich in resources for life sciences, biotechnology and the medical industry. Iceland has a total R&D expenditure of over 3pct. of GDP, an advanced health care system and an advanced research infrastructure with a relatively large number of highly qualified specialists. Iceland is home to world-leading companies in population-based genomics, ecological genomics involving thermophilic bacteria from geothermal areas, molecular farming of transgenic plants, prosthetics and medical diagnostic devices (Embassy of Iceland in Beijing, 2010).

### **5.2.2 Turnover in the Nordic health industries**

The largest turnover in the health industry in the Nordic countries is made up of Swedish enterprises with Danish enterprises coming in as a close second. The large turnover in Denmark and Sweden is especially comprised by the manufacturing and sale of pharmaceutical preparations or products. In Finland and Norway it is the manufacturing of medical, precision and optical instruments and watches in particular that contributes to total turnover, though on a lower level.

Figure 5.2 Turnover in the health industry in the Nordic countries (in million €), 2007.



Source: Eurostat and Statistics Iceland

Note: For Denmark, Eurostat data are only available for 2006. There are no data for Iceland in EUROSTAT. Data are from Statistics Iceland and is therefore not fully comparable.

### 5.2.3 Employment performance

Sweden has the highest employment in the health industry among the Nordic countries with more than 56,000 persons employed in the industry. Again Denmark comes in as a close second with more than 43,000 employees. It is the areas of medical, precision and optical instruments and watches in particular and pharmaceutical products or preparations that boost total employment.

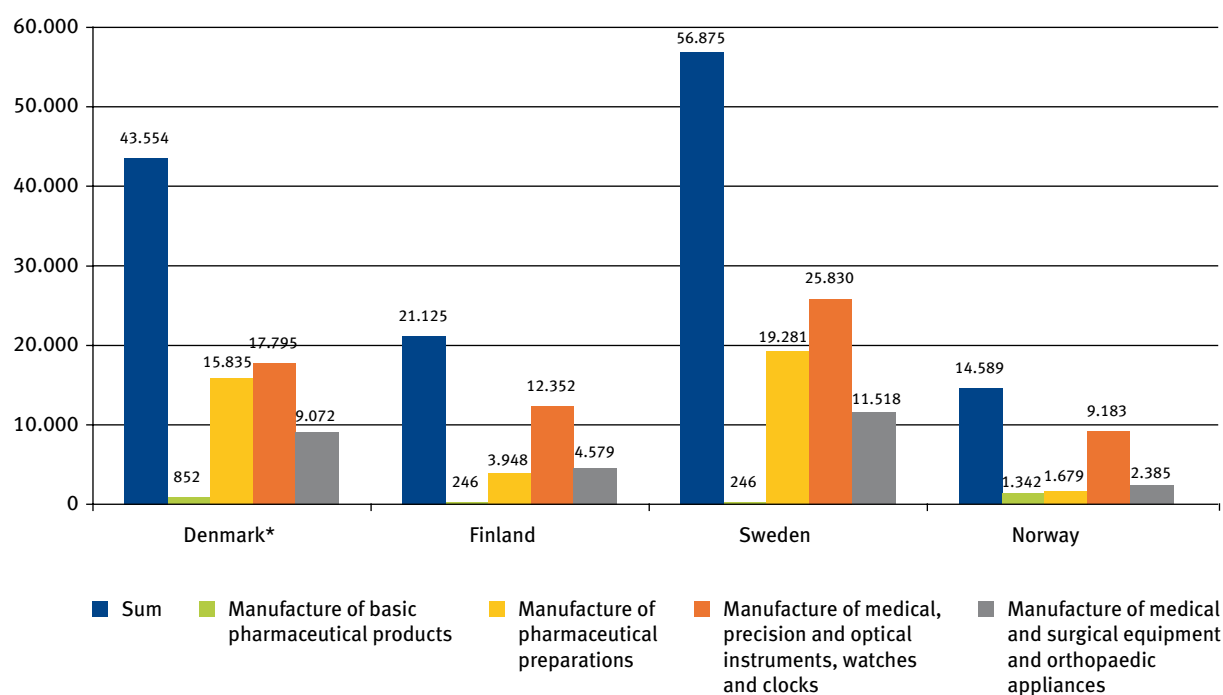
Recent studies show that over half of all Danish employees (54 pct.) worked in R&D companies with a product on the market (including licences). The comparable proportion in Sweden was 43 pct. A higher share was employed in manufacturing in Sweden, about 40 pct. compared to 33 pct. in Denmark. Consulting plus product development was also somewhat higher in Sweden, 15 pct. versus 11 pct. (Vinnova 2008). Comparison of business segments reveals that drug discovery and development is the dominant area in both countries. When drug production and health-related bioproduction are added, the pharma companies had half of all employees (50 pct. in Denmark, 51 pct. in Sweden).

The medical technology sector employed about 30 pct. of the life science work force in Sweden and almost as many in Denmark (28 pct.). Audiological devices are a Danish speciality, while Sweden has more Electromedical and imaging equipment. In the biotech sector, Denmark had much more employees in industrial and food-related biotechnology (jointly 12 pct.), while Sweden had a higher share of the employees in Biotech tools and supplies.

### 5.2.4 Productivity in the Nordic health industry

The most productive companies, measured by the gross value per employee are to be found in Norway in the manufacturing of basic medicines, and in Sweden in the manufacturing of pharmaceutical products. For Denmark the industry with the highest gross value added per employee is the manufacturing of basic medicines, while in Finland it is the area of medical, precision and optical instruments and watches.

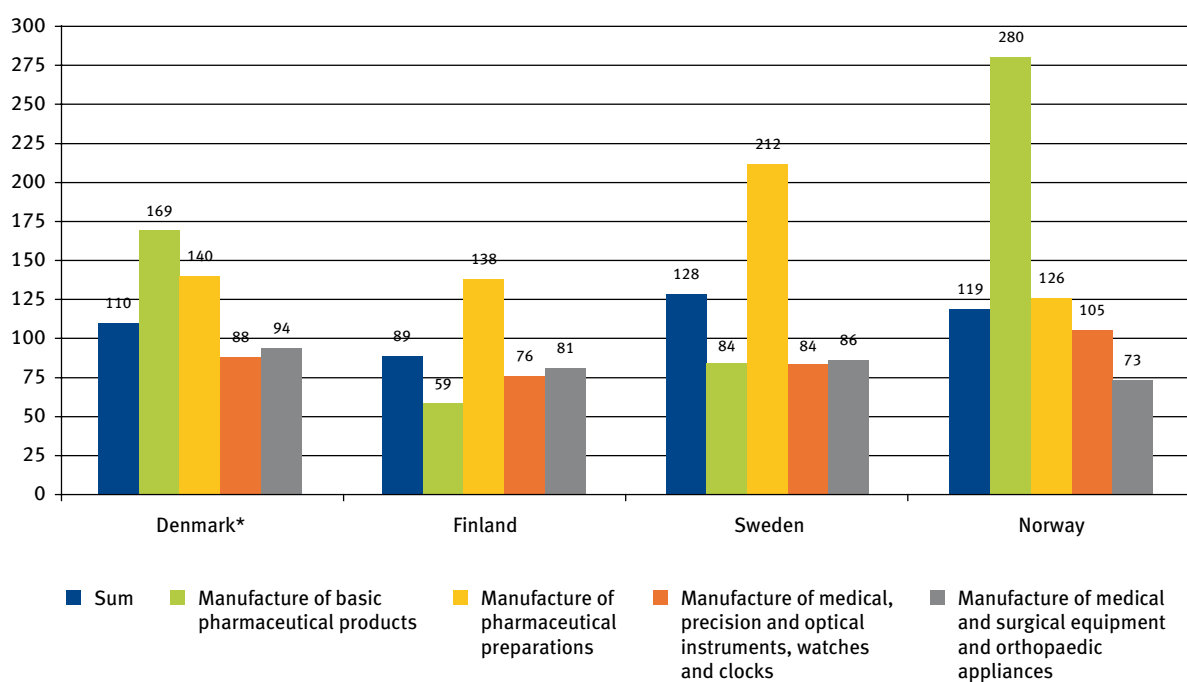
Figure 5.3 Employment in the health industry in the Nordic countries, 2007



Source: EUROSTAT

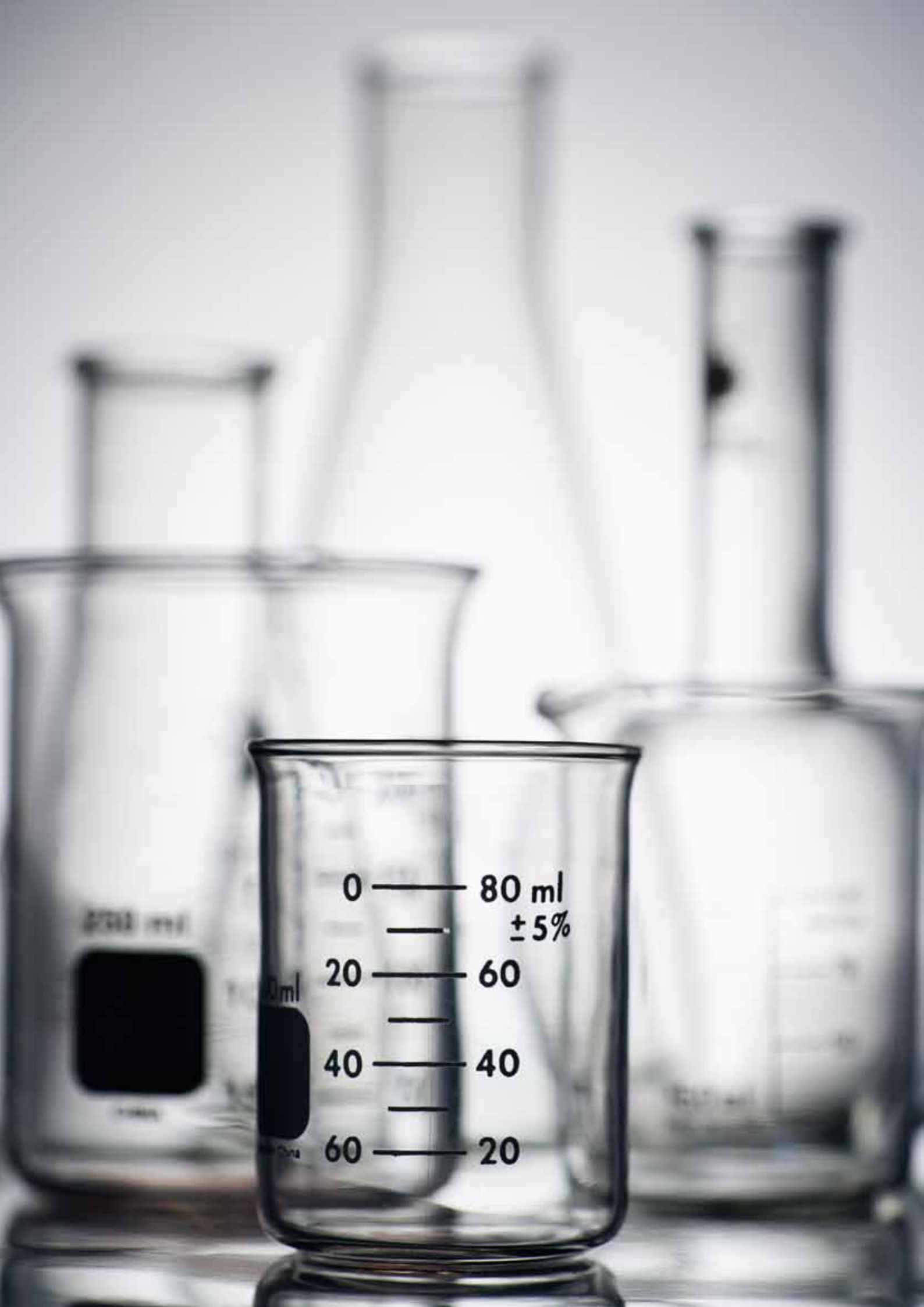
Note: Data for Denmark are from 2006 as data for 2007 are not available from Eurostat. Data for Iceland are not available.

Figure 5.4 Gross value added in 1000 € per employed in the health industry in the Nordic countries, 2007



Source: EUROSTAT

Note: Data for Denmark are only available from 2006 from Eurostat. Data for Iceland are not available.



## 6 Iceland

This chapter presents the study conducted on Iceland regarding health innovation in public private collaboration. The main findings derived from the Icelandic study as follows:

- Collaboration on innovation between public and private actors is the preferred collaboration mode for Icelandic actors when developing new solutions based on user needs, whereas public procurement processes are chosen when standard solutions are required and price is the important parameter.
- Personal relations and networks serve as an enabler, but also as a constraint in the selection of participants for collaboration projects.
- International orientation is common in health innovation efforts in Iceland. Often partners from other Nordic countries are invited to collaborate.
- Target markets for Icelandic innovators are primarily the Nordic countries and the United States. The Icelandic home market is small and considered a test market by the actors.
- The greatest potential experienced by Icelandic public and private actors is associated with the synergies that exist between participants' competences, which result in better and more innovative solutions and more satisfied users. The largest barriers in Iceland are related to the lack of policy frames and support systems that enhance collaboration. A national-oriented mindset in the Nordic countries is also perceived as a barrier for increased collaboration across the countries.

### 6.1 Background

The health care system in Iceland is composed of a central unit with the ministry of health as the main authority and the Landspítali as the main hospital in the country. The country is divided into health care regions, each with their own primary health care centres, some of which are run jointly with the local community hospital. In particular, the Landspítali and the health care regions are the central public actors when it comes to health innovation in Iceland.

In recent years several policy steps have been initiated to promote information-sharing and collaboration among stakeholders in the fields of health technology and innovation. The objective is to encourage firms, institutions and individuals to increase domestic and foreign cooperation for

development and marketing within health care to meet the needs of the public health system for more efficient and better solutions to improve the quality of life and quality of the health care in general.

This chapter on Iceland is based on data from three Icelandic case studies comprising 6 interviews with both public and private representatives, a workshop with 29 health practitioners and a survey distributed among Nordic health experts and practitioners. See Appendix B and C for a description about the data. The three cases that have been conducted in relation to the study on Iceland are presented in the following figures and represent examples of innovation in ICT, Health services and Medical techniques.

#### The midwife clinic, Björkin

**The aim** of the establishment of the midwife clinic, Björkin, is to provide more integrated health services to expectant parents. The clinic offers childbirth education classes, home births and post-partum services to parents. Post-partum service is included in Icelandic health insurance and is mainly provided by independent midwives. Björkin wishes to coordinate post-partum services for the hospitals and parents to make the coordination more efficient and to enable more integrated services. The project involves the Ministry of Health, the Icelandic Health Insurance and the Innovation Center Iceland. The project has been partly funded by the Midwife Association of Iceland and the Ministry of Social Affairs that support female entrepreneurs.

**The learning points** of Björkin concern how a publicly-provided maternity and post-partum service could be handled more effectively and with greater consideration for user needs when it is conducted in close collaboration between public and private actors. The case demonstrates how the Icelandic system of post-partum service needs to be improved and agreed by all stakeholders, but that there is a resistance to change among key actors in the health insurance system, while at the same time physicians prevent progress.

**Source:** Interviews with Björkin and Iceland Innovation Center

**Nox Medical – the sleep diagnostic tool**

**The aim** of Nox Medical is to develop a new system and method for sleep diagnostics. The product detects and diagnoses sleep disturbances that can cause other illnesses such as high blood pressure, diabetes, heart failure and strokes. Nox Medical was formed in 2006 by seven experienced engineers and has since its foundation collaborated with physicians at the Landspítali in Reykjavík and received inputs from doctors in the US and Italy. The project has been funded by private shareholders and a grant from an innovation fund in Iceland. The products are sold worldwide and generated global sales of 1 million Euro in 2009.

**Lessons learned** from Nox Medical is a best practice example of how a small entrepreneurial start-up company has through collaboration with public physicians in Iceland, Italy and the United States developed a new medical technique that could potentially revolutionise diagnostics of life threatening diseases. The cooperation includes an agreement where Nox provides Landspítali with products for free and physicians in turn provide data from validation. This means that the product is released for global sale when it is ready and all feedback has been provided.

**Source:** Interviews with Nox Medical, Landspítali and Iceland Innovation Center

**Mentis Cura – developer of health statistical software**

**The aim** of Mentis Cura is to develop a statistical software service to hospitals that calculates the probability score concerning the likelihood of a patient having a disease like Alzheimer's or ADHD. The method can identify the illness several years before any symptoms occur. Mentis Cura was formed in 2004 and has worked with the main hospital, Landspítali in Iceland, and with Ullevaal Hospital in Oslo from the beginning. The project was initially funded by public funds provided by the Icelandic Centre for Research and, later, private investors (primarily from the United States) got involved.

**Lessons learned** from Mentis Cura is a best practice example of how collaboration between public and private actors can result in entrepreneurial outcomes. Mentis Cura was formed as a company through a collaboration that initially focused on research. The research demonstrated a market potential that was commercialised through the company. Strong collaborations with hospitals in Iceland and abroad continue through all phases of development and scientific work, as well as market access.

**Source:** Interviews with Mentis Cura and Landspítali

## 6.2 Public Private Collaboration

The study on Iceland has its main focus on public private collaboration on innovation and public procurement processes, as these two types of collaborations are central in the case studies, workshops and survey results.

Insights from the Icelandic study indicate that it is personal relations and existing networks that pave the way for collaboration involving actors from the public and private sector. The informal way of arranging collaborations in Iceland makes them easy to initiate, and they benefit from being embedded in trust and mutual understanding. However, when personal relations cannot connect to the relevant public or private actor, there are limited mechanisms in place that can support or facilitate collaborations between public and private actors in the health sector.

The study shows that also public procurement processes are an integrated method of collaboration between public and

private actors in Iceland. Public procurement is seen as useful in the later stages of the value chain when products and solutions have been developed and standardised. The experience of public procurement in Iceland is associated with getting the best solution for the lowest price possible. Public institutions are also considering how to demand innovative solutions through tenders and procurement processes.

## 6.3 Cooperation with Nordic partners

The study shows that because Iceland is a small country, it is crucial that all innovation projects are born global if they wish to become more than just a project. International orientation is therefore very dominant in the Icelandic mindset, and serves as a motivational factor in the composition of collaboration teams. When selecting partners there is a general orientation towards the other Nordic countries where personal networks exist and similar health care systems reside,

however the informants also indicated that it is just as natural to turn the attention towards the United States when considering international participation in health collaborations. It is, however, the view of practitioners within the health care sector in Iceland that their international orientation is not necessarily shared when seeking collaborations with actors in the other Nordic countries.

Despite the apparent international orientation in collaboration in health innovation, it is noted that procurement processes tend to include only Icelandic participants, but it is considered an untapped potential to include Nordic bidders to public tenders in Iceland.

The survey depicts that the majority of innovation projects in Iceland are conducted with participants from the home country. This is presented in Figure 6.1 below that also shows that there are international participants in Icelandic innovation projects.

## 6.4 User-driven methods

User-involvement in health collaboration is applied in Iceland as indicated in Figure 6.2. It shows that various degrees of user involvement occur in Iceland, ranging from the inclusion of users to more advanced degrees of user involvement.

The insights from the case studies confirm the above picture and highlight that user involvement is considered a crucial part of the development of products and solutions in the

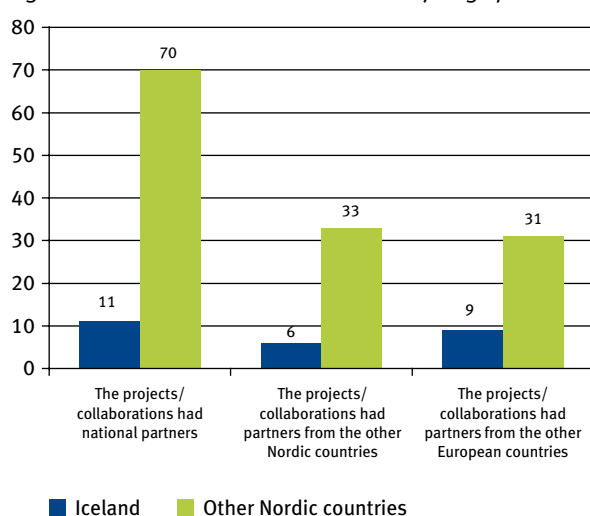
health sector; it can, for example, enable testing and validation of the developed product and solution in the applied context.

However, at the workshop it was noted that public procurement processes in Iceland tend to focus more on delivering products at the lowest price and less on delivering products tailored to specific user needs. Hence, procurement practitioners in Iceland demonstrated little experience of user involvement. It is however under consideration to include users as part of procurement processes in selecting tenders that not only respect the focus on price, but also cater for user needs.

## 6.5 Entrepreneurship

The study on Iceland has shown that entrepreneurs had a positive connection to public private collaborations. In some instances highlighted in the study, companies have emerged through the collaboration established with the public actors, and in other instances the collaboration has resulted in a spin-off company that commercialised the idea derived from the collaboration. It was, however, mentioned that it was not common to include more than one entrepreneur as part of a collaboration team, due to limited resources.

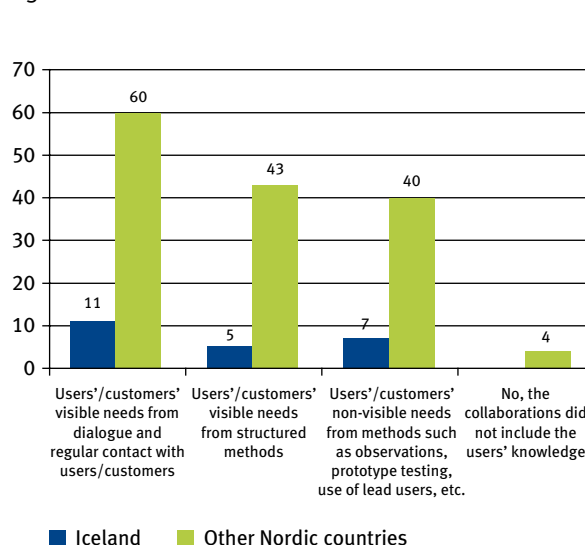
Figure 6.1 Collaboration with national and foreign partners



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Iceland is subtracted.

Figure 6.2 User involvement



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Iceland is subtracted.

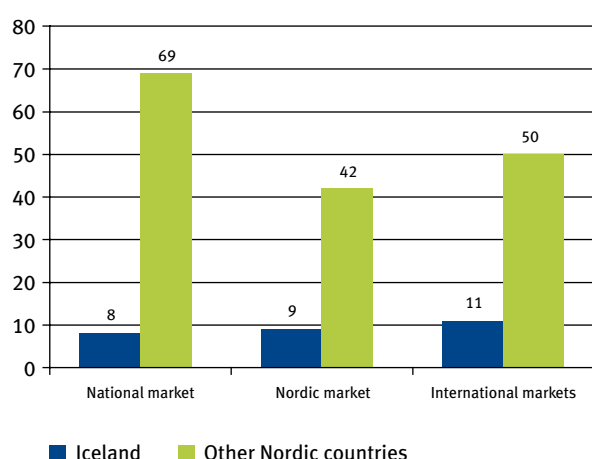
## 6.6 Access to market

As Iceland is a small home market, innovation efforts need to have a global perspective from the beginning in order to demonstrate a business potential. The study indicates that Icelandic health products and solutions are tailored to a global market from the initial phases of development. Some Icelandic collaborations are primarily oriented towards the United States, whereas others are more focused on the Nordic market. In connection to this, Iceland is considered a natural test market for the invented product or solution from where global markets are approached. As a workshop participant underlined; *“the home market should be perceived as Nordic and not the local market of Iceland”*.

The study also shows that within the health sector in the other Nordic countries, Icelandic practitioners have experienced scepticism from Nordic counterparts to health solutions and products that were not developed within the national borders of their own country. This indicates that the Nordic market has to be an ambition for all parties involved if the potential are to be met.

Figure 6.3 below presents the answers from the survey regarding target markets. It shows that, along with the statements from the workshop and case-studies, the figure indicates that there is less orientation towards the national market than in the other Nordic countries, and a similar orientation towards the international markets.

Figure 6.3 Target markets



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Iceland is subtracted.

## 6.7 Barriers and potential

There was substantial agreement that successful collaborations between private and public actors within health innovation leads to products and services that are better and with a greater potential than had they not been developed in collaboration. In particular, private actors have highlighted that the greatest benefits from collaborating with a public actor is that efficiency and sales are increased. Public actors accentuated that collaboration resulted in more satisfied users and had increased job satisfaction among employees. Additionally, collaboration had improved work processes and made operations more economically efficient, while also helping to promote an innovative culture in public institutions.

The benefits experienced represent great potential for strengthening collaboration between private and public partners in health innovation. However, there are still barriers to overcome in order to unleash the full potential.

The lack of facilitating and supportive systems to guide and structure health innovation in public private collaborations was considered a barrier in Iceland. This is particularly crucial when personal relations are unable to provide connections to collaboration partners, and when mutual trust doesn't guide the collaboration. Additionally, a common political vision within health innovation was advertised for.

The public sector has limited resources to participate in innovation projects with. This forms a barrier to collaborations as actors from the public sector receive limited support from the institution towards time allocation for innovation projects. Some physicians also appear resistant to change and thus demonstrate limited willingness to participate in innovation projects.

The current financial crisis constitutes a barrier against collaboration, as there is political and financial instability. There have been great changes within the ministerial cabinet in Iceland, which has affected continuity in the country's overall health strategy. The currency fluctuations are also a barrier.

There is a lack of interest in other Nordic countries in innovations developed elsewhere. A major barrier to increased collaboration among the Nordic countries lies within the mindset of the other Nordic countries. There seems to be reluctance towards health solutions and products that have been developed outside the borders of the individual Nordic country.

# 7 Finland

This chapter presents the results of the study on health innovation in public private collaboration in Finland. The main findings of the study are as follows:

- Public private collaborations on innovation are used extensively in development projects where input to new public solutions and services are needed. Procurement processes is also applied across the public and private sector in Finland concerning new health products and solutions.
- User-driven methods are widely used in innovation projects as user perceptions are considered important within the health sector.
- Finland has a pronounced focus on including entrepreneurs in public procurements, and there is emphasis on giving smaller companies access to the health care market.
- The study shows very little collaboration with Nordic partners on health innovation projects.
- Potential in public private collaborations in Finland relates to the private companies experiencing better access to the national market with increased sales as a positive outcome, and the public sector getting valuable input from establishing an innovative culture that provides better products and services to its citizens.
- The most common barrier to public private collaboration is a perception of lack of flexibility in regulations and contractual rules.

## 7.1 Background

Finnish municipalities play an important role in the provision of health care services in Finland. By law they have the main responsibility for providing basic services such as education, social services and health care. Health care is provided through local health centres and hospital districts. Municipalities belong to a hospital district, of which there are 20 in total.<sup>6</sup>

According to a study by the European Observatory on Health Care Systems about two thirds of the total health care expenditure in Finland is spent on health services provided by municipalities. The remainder goes to medicines and pharmaceutical products, private health care, medical aids and occupational health care.

This chapter on Finland is based on data from three Finnish case studies comprising 7 interviews with both public and private representatives, a workshop with 9 health practitioners and a survey distributed among Nordic health experts and practitioners. See Appendix B and C for a description about the data.

### Kotitori home services for the elderly

**The aim** of the project is to enable elderly people to live at home for as long as possible and to provide a better and more user-friendly set of services. The Kotitori project has resulted in an integrated service system based on IT. The project began in 2006 and started looking at new ways of providing services to the elderly and began discussions on a new service model that included cleaning, grocery and traditional home care services. Various private and public actors were involved in the process. The company Mawell Care provides IT systems, and Nordic Health Care Group has helped develop the supplier network. Services which Mawell Care subcontracts from other firms or which refers to public services. The service center has been in operation for a year.

**Lessons learned** from the Kotitori case is that a more efficient and user-friendly service to the elderly is provided through the new service system. The amount of paperwork for the municipality has been reduced, enabling care takers to focus more on health care. Because home services are made more user-friendly, the elderly are able to stay at home longer.

**Source:** Interviews with Tampere Municipality and Mawell Care

6) European Observatory on Health Care Systems (2002) Health care systems in Transition, Finland

The three cases that have been conducted in relation to the study on Finland are presented in the following figures and represent collaborations within Health services, ICT solutions and Medical technique.

## 7.2 Public private collaboration

The study on Finland focuses on the two types of public private collaborations: public procurement and public private collaborations on innovation.

The findings illustrate that public private collaboration on innovation is an applied method when seeking new approaches and solutions to challenges experienced in the health sector. Collaborating across the sectors provides useful input into the effort to develop better products for the public health sector. It is noted however that the public actors in

general have a tendency to be sceptical of the private sector being too profit-oriented, and that the private sector tends to see the public sector as unnecessarily bureaucratic.

Public procurement is applied as a way of collaborating for more standardised solutions. Private actors argue that, despite the great potential of procurement processes, it can be rather complicated to participate in the public procurement processes.

## 7.3 Cooperation with Nordic partners

According to the Finnish study there is limited experience in collaborating with Nordic partners on health innovation. Figure 7.1 shows the responses on collaboration with national, Nordic and foreign partners from the survey, indicating that the Finnish respondents tend to collaborate with national

### Helsinki health entrepreneurs

**The aim** of the project is to make it easier for small companies and entrepreneurs to offer services to Helsinki city's health and social services. The outputs are twofold. First of all, the project has enabled information sharing and education for entrepreneurs and the city, which has allowed both sides to understand each other better. For the entrepreneurs, it has been particularly useful to understand how public procurement processes and tenders work. Secondly, the project has put together networks of entrepreneurs, thus helping the entrepreneurs to put tenders together in areas where you need to be substantial size to compete. The project consists of the organisation of Helsinki Entrepreneurs, Helsinki Municipality and the Centre for economic development, transport and the environment. The latter has mainly provided funding.

**Lessons learned** from the project are that through shared information about procurement processes, small businesses also have a chance to compete in procurement processes. By opening up the market the municipality hopes to give a better choice of service provider and drive down costs.

**Source:** Interviews with Helsinki Municipality and Helsinki Entrepreneurs

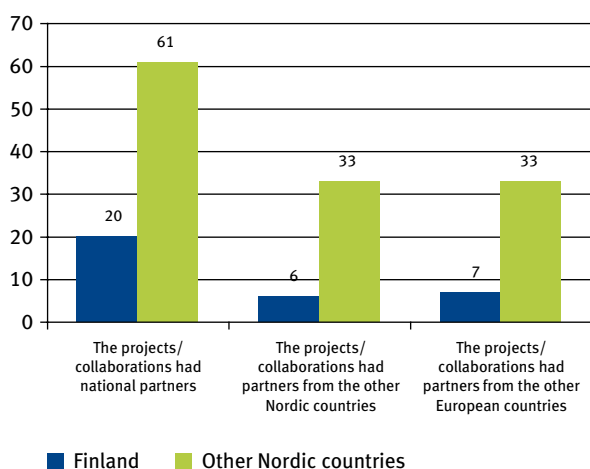
### Caring TV

**The aim** of Caring TV was to optimise the well-being of elderly people through the use of new technology and videoconferencing systems in order to enable them to stay at home longer. Services such as alarm systems, cookery classes, and physiotherapy were developed, as was a technological platform supporting the services. The project was organised as part of the project Coping at Home and included a collaboration with Laurea University, the City of Espoo, TDC Song and Videra Oy. The project has received funding through Tekes and EU/EAKR and used a method of action research. The project involved elderly users in developing the service system and content for the new technology, and enabled testing of the new technology in the homes of the elderly people.

**Lessons learned** from the project are that through a public private collaboration different perspectives can together provide shared innovation. The project has resulted both in commercial products and more research in this area, and in a better understanding of the needs of the elderly. It is also a best case example of how users can be involved in the development process in order for service solutions to be better tailored to user needs.

**Source:** Interviews with Laurea University of Applied Sciences and Videra Oy

Figure 7.1 Collaboration with national and foreign partners



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Finland is subtracted.

partners and are not more likely to collaborate with partners from the other Nordic countries than partners from the other European countries.

## 7.4 User-driven methods

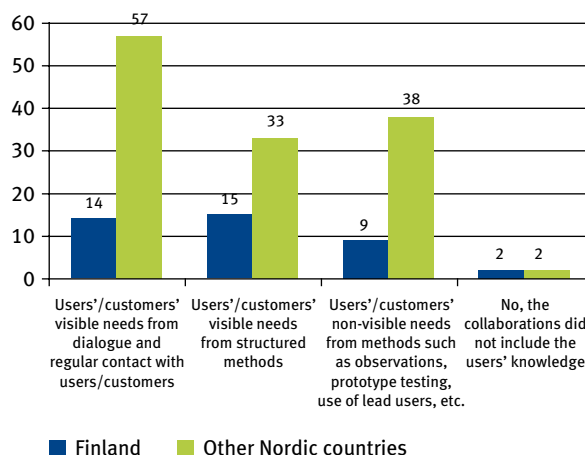
The study indicates that involving users is widely practised in health innovation projects. Continuous contact, dialogue and feedback with users are promoted as a key element in the development of health solutions. Practitioners from both the public and private sector emphasized that Living Labs could be a useful tool for structuring user-driven processes. However, the full potential of Living Labs had yet to be demonstrated.

Figure 7.2 shows the survey responses to the different types of user-driven methods. The figure shows that like in the other Nordic countries, the Finnish respondents argue that user methods are applied in innovation projects. The actual involvement of users ranges from simply including users to more structured and advanced user-driven methods. This corresponds with the findings from the workshop and the case studies.

## 7.5 Entrepreneurship

The study shows that Finland has a profound focus on including entrepreneurs in public private collaborations on innovations and in procurement processes.

Figure 7.2 User involvement



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Finland is subtracted.

The focus on entrepreneurs is particularly emphasised with regards public procurement where initiatives support small companies' access to the health care market through their participation in public tenders. Their participation is aided through information to the entrepreneurs, development of networks and by giving the procurement responsibility to a private actor which serves as an integrator for other service providers. Additionally, there is coordinated action to get several entrepreneurs to bid for a tender as a group, thus enabling a combined larger quantity adhering to requirements on price, which is often a barrier to entrepreneurs' participation in public tenders.

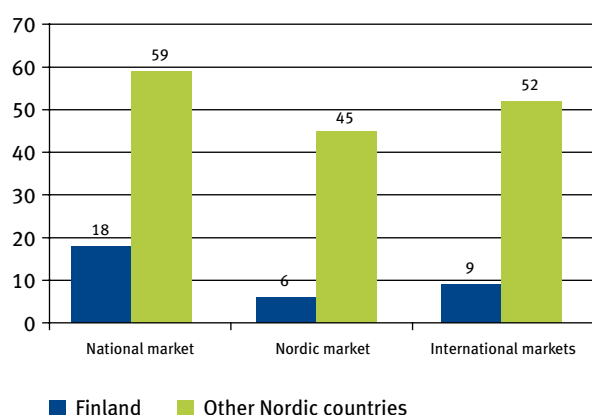
The study also highlighted that in collaboration on health innovation, it was common to include entrepreneurs as collaboration partners. Entrepreneurs' participation on innovation projects depended on competences and skills, but there was no discrimination towards the size of the collaboration partner.

## 7.6 Access to market

The study on Finland shows that new health products and solutions are primarily targeted at the national market. As indicated in figure 7.3, Finland thereby follows the Nordic trend of focusing mainly on the national market.

The study indicates that despite the pronounced local focus, considerations on expanding to the other Nordic markets and in a wider international context is an important part of the ambitions for the Finnish health innovation projects.

Figure 7.3 Target markets



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Finland is subtracted.

In particular, private partners involved in collaborations on health innovation underline that their participation is based on a clear market potential and they express a wish to have a stronger focus on the Nordic market. They also highlight that there are vast opportunities in the similarity between the health systems in the Nordic countries that could be further explored.

## 7.7 Barriers and potential

The findings on Finland have illuminated that synergies in the combined competences across the private and public sectors is a benefit of collaborating. The private actors argue that collaboration with the public sector help them to expand their networks, including knowledge of users and their preferences. Furthermore, the potential of collaborating is related to expanding market opportunities in Finland and thus also to increasing sales.

Public actors primarily associate potential in collaboration with improved work processes and input into creating a more innovative culture in public institutions with more satisfied users. There are, however, barriers preventing the full potential to be released. The three main barriers identified in the Finish study are:

Tax issues and regulations are barriers to smooth collaboration between public and private actors in Finland. The study has illuminated that there is a lack of information and guidance on policy regulations concerning collaborations between public and private actors regarding health innovations.

A culture gap in the approach to innovation between public and private actors constitutes a barrier to collaborations, especially collaborations with a high degree of involvement in the innovation phases.

Lack of knowledge-sharing across the Nordic countries is a barrier to Finish innovations wishing to expand to markets outside the home market. The lack of knowledge on how to approach and implement health solutions and products in the other Nordic markets to some extent prevent greater Nordic interaction.

## 8 Sweden

This chapter presents the study conducted on Sweden regarding health innovation in public private collaborations. The main findings derived from the Swedish study are as follows:

- There is limited experience of collaborating with Nordic partners, not necessarily because of a high cost of cooperation, but because the transaction costs with regional and national partners are even less.
- Entrepreneurs experience different barriers to developing their innovative ideas. Public procurement requirements and the financial and time cost of participation in standardisation processes have been raised as the main issues.
- The public procurement processes may be adopted to include innovation, but this option is rarely used. Cultural barriers seem to be more important than the legal when it comes to the strategic orientation of the processes.
- Several of the private and public respondents would like to increase the funding of private sector research and user-driven innovation organised by public health care providers. Many of the universities are considered to be too introverted and too focused on peer-reviewed publishing.
- There is a lack of private venture capital and lack of public measures to stimulate private investments in innovation as a barrier for development of research based innovation. The study also points to limited resources and lack of incentives to stimulate user-driven innovation.
- There is a specific need to stimulate innovation and entrepreneurship in the primary care sector.
- The study has presented lack of knowledge-sharing and funds to support projects that cut across the Nordic countries.

### 8.1 Background

Sweden's health care system is highly decentralised. Its 21 county councils are responsible for hospitals, while its 290 municipalities provide municipal care. In Sweden, the county councils and municipalities are also the main providers of health care, with only about 10% of all health services delivered by private providers. In this chapter we investigate public private collaboration in the health care sector in Sweden.

This chapter on Sweden is based on data from three Swedish case studies comprising 6 interviews with both public and private representatives, a workshop with 8 health practitioners and a survey distributed among Nordic health experts and practitioners. See Appendix B and C for a description about the data.

The three cases that have been conducted in relation to the study on Sweden are presented in the following figures and represent collaborations within Health services, ICT solutions, Medical technique and Bio medicine.

#### **Mobipen – a digital pen for registration of home care services**

**The aim** of the project is to establish a new standard for documenting in-home care provision in the municipalities. The Mobipen idea came from Cartel, which is a company that supply software and similar technology to municipalities. The idea was pitched to Solna municipality, which acted promptly and launched a collaboration project. The technology was developed in collaboration between Cartel and Solna municipality. The project output is a digital pen that home care providers carry when they arrive at a client's home. They use it to mark a laminated paper label hidden in the door frame in the homes. The system registers who is holding the pen, whose home the person is in and what time it is. The pilot project was carried out without a previous tender process. According to Cartel the public procurement rules are barriers to innovation created in public private collaboration.

**A learning point** is that it is important that the public sector has knowledge on how new solutions can be developed and how collaboration with private actors can be organized most effectively. A key success factor was the commitment of key employees and the culture in the Solna municipality.

**Sources:** Interviews with Cartel and [www.halsansnyaverktyg.se](http://www.halsansnyaverktyg.se)

**New tools for health (Hälsans nya verktyg)**

**The aim** of the project is to reduce public expenditures by stimulating innovation in care. New Tools for Health (Hälsans nya verktyg) was formed on the basis of a competition announced by Vinnova on ideas for regional growth. An environment at the University in Linköping took the initiative to apply for funds to establish an innovation cluster. By time the effort is concentrated on efficient home-based healthcare and community care solutions. The project output is the organisation New Tools for Health (Hälsans nya verktyg) which is an association/cluster that develops new products and services to meet growing future care needs.

**A learning point** is that private companies may be better to invest time to get in touch with local health authorities. Further, authorities can improve procurement processes in order to stimulate innovation. The problem is not the public procurement rules, but how the purchase is designed. In addition, municipalities should to a larger extent encourage and facilitate new ideas among those working in home health services.

**Source:** Interviews with Hälsans nya verktyg, Norrköpings kommun

**NeoDynamic – innovation in breast cancer science**

**The aim** of the project is to enhance innovation in breast cancer science. Early discovery as well as a prompt treatment is essential to save the lives of cancer patients. This was the starting point for the two professors Hans Wiksell and Gert Auer when they founded NeoDynamics AB in 2004 at the Karolinska Institute in Stockholm. Wiksell and Auer's network among scientists and relevant persons in both private and public sector was essential for the product development as the work has taken place outside working hours at the Karolinska Institute and they have not received any public funding. NeoDynamics is developing two technologies for treatment of breast cancer. Anti-Meta is a tissue sampling method to minimize the risk of tumor cells spreading. Preferential Radiofrequency Thermotherapy (PRFA) is a minimally invasive breast-conserving therapy for small, well-localized breast cancers. Public clinics lack proper funding for applied clinical research and a small business must pay for all searches made.

**A learning point** is that a strong clinical network and stimulating creation of networks increases the potential for successful innovation. Increased funds and resources for innovative solutions within the public health care sector would to a larger extent enable them to contribute and help patients. Free authorization from MPA would also reduce barriers to innovation.

**Sources:** Interviews with NeoDynamics and [www.karolinskadevelopment.se](http://www.karolinskadevelopment.se)

## 8.2 Public private collaboration

Public procurement and outsourcing are among the most common ways of public private collaboration in Sweden. Public private collaboration on innovation is also well established, however it is more widespread at the tertiary care level with universities and hospitals as active public partners. There are several initiatives to stimulate similar collaboration at the primary care level like Innovasjonssluser and Hälsans nya värld. These projects tend to be user-driven in the sense that employees identify better solutions in care delivery.

Solutions and products that are being developed through public private collaboration on innovation have to be subjected to a public procurement process once the outcome is matured and ready to be applied in the public sector. The focus on price in public procurement processes are not supportive of products and solutions that have been developed

through innovative collaborations. Pre-commercial procurements are a possible bridge over this “valley of death”, but are rarely used. The participants in the workshop emphasize the cultural barriers and not legal barriers to explain the limited prevalence of such projects. They have the impression that pre-commercial procurement as an option is not well understood by the procuring institutions and a limited interest in being a first mover to establish a practice.

Many informants in Sweden emphasize the need to strengthen the private partner in a public private research-based innovation project. There is an impression that a too large share of the research funding is directed to the universities and that the universities are measured on international publications only, and not innovation, patents and commercial success. This results in research projects not being sufficiently focused on market demand. The EU requirement of private participation in innovation projects is highly welcomed.

### 8.3 Cooperation with Nordic partners

The response from Swedish informants indicates that identifying relevant partners to collaborate with on innovation projects in the health sector is not a difficult task. In practice, the collaboration usually takes place between national actors, see figure 8.1. Within research, collaboration with the international research community is important, but the private risk capital is often provided by national actors. There are examples of Nordic cooperation both with technology transfers offices (TTO) and leading companies in the other countries, mainly case specific.

The Swedish cases all demonstrate a low rate of actual involvement from participants that were not from Sweden. This is due to a lack of knowledge of relevant partners in the other Nordic countries. However, the general impression is not that it is difficult to collaborate with other Nordic partners, but that it is generally easier to pick a national partner.

### 8.4 User-driven methods

The survey indicates that inclusion of users is common in health care innovation projects, see figure 8.2. The Swedish respondents demonstrated experience of using structured methods, e.g. market analyses and focus groups, or from methods such as observations and prototype testing to include knowledge on users' and customers' needs.

The cases and workshop underline that user-driven perspectives are included in the projects and are often derived from

users' or consumers' needs. The workshop participants stressed the need to strengthen the stimulation of user-driven innovation, especially at the primary care level. There are a growing number of public initiatives, but a generally weak culture for business development and innovation in the health sector in Sweden.

The newly established competition for medical centres at the primary care level (vårdcentral) has initiated a number of new innovations in service delivery from private groups. This benefit of increased innovation and entrepreneurship must be balanced against other effects like the increasing over-capacity of medical centres.

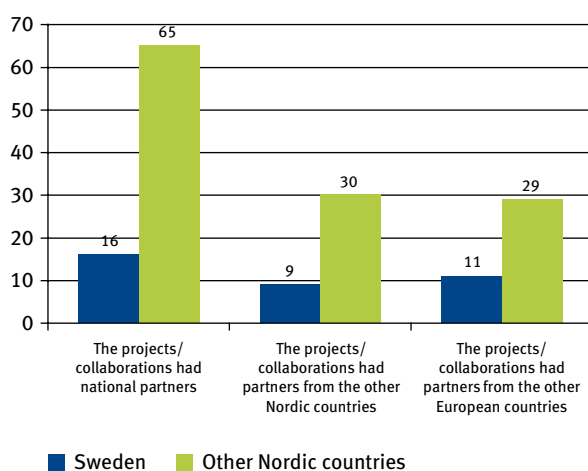
### 8.5 Entrepreneurship

The Swedish study indicates that entrepreneurs are included in health innovation projects and the cases demonstrated evidence of entrepreneurial spin-offs.

However, the strict focus on price and detailed description and documentation of the product or service in public procurement processes makes it hard for entrepreneurs to participate in public tenders. The alternative for pre-commercial procurement is less familiar or regarded as too complicated. Small-scale production and therefore higher costs, as well as demanding requirements for guarantees of future support also decrease the probability of success.

Entrepreneurs often cannot afford the participation fee and time cost of participation in standardisation processes. Thus

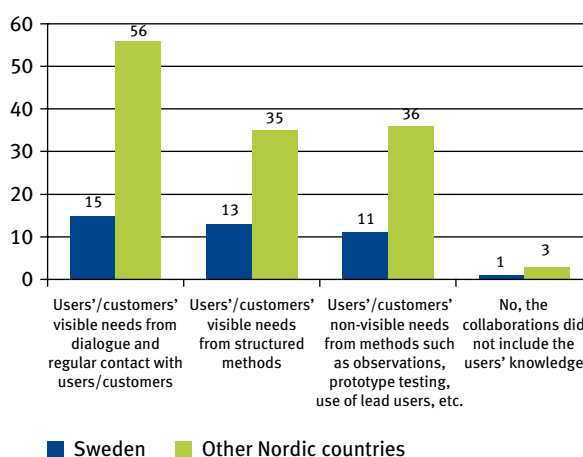
Figure 8.1 Collaboration with national and foreign partners



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Sweden is subtracted.

Figure 8.2 User involvement



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Sweden is subtracted.

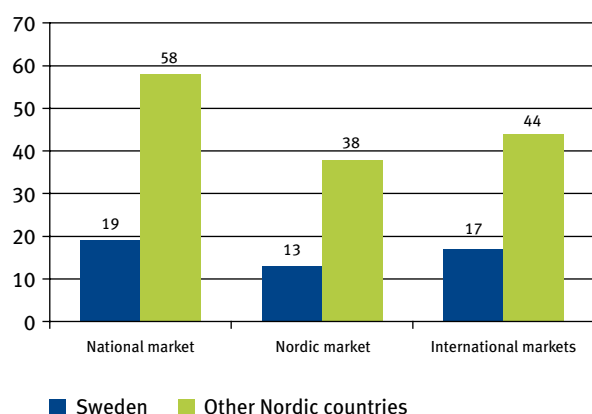
the standards are developed in accordance with the products and services of the established providers. If a higher number of entrepreneurs could be stimulated to participate in the standardisation processes there is reason to believe that their products and services would match the established norms, and thus have an increased probability of being accepted by the public procurer.

## 8.6 Access to market

The survey indicates that Swedish respondents have experienced barriers to entering the Nordic market. Very few projects consider the Nordic potential and thus do not include a Nordic perspective in the design and development phase. The survey indicates that the national market is most often the target for the projects, see figure 8.3.

The informants highlighted Swecare- a platform where academia, the public and private sector join forces toward enhanced export and internationalization of Swedish health care and life science – as a door opener for companies and organisations to collaborate and achieve market access.

Figure 8.3 Target markets



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Sweden is subtracted.

## 8.7 Barriers and potential

The Swedish study on public private collaboration in the health care sector shows that there is a potential for seeking opportunities across institutions, companies, networks, both within regions, nationally in Sweden and across the Nordic countries. The importance of culture was stressed as there are differences in the approach to innovation in the public and private sector. There is a potential in aligning the perception of innovation when collaborating on health solutions.

The low barriers in relation to language, culture and the organising of the welfare systems between countries are all elements that constitute great potential for increased Nordic cooperation, but such cooperation must be stimulated financially and by provision of information to be initiated on a larger scale. The main barriers that emerge from the study relate to:

There are significant cultural differences between traditional public sector healthcare and private sector business development. There has been both a lack of tradition and few incentives for the health personnel to initiate innovation in the public sector. The cultural barriers have to be particularly addressed in primary care, where public employees are often not encouraged to innovate and where the element of competition has been traditionally lacking.

The limited experience of pre-commercial procurement is a barrier to its wider application. Extra work-load for procuring institutions, cultural barriers, including fear of wrongdoing and lacking information, hinder the growth of this collaboration method.

There is a need to strengthen the development of robust models for private public collaboration with models, including the sharing of rights and risks between inventors, institutions and private investors. User-driven innovation and innovation in primary care in particular must learn from the established best practice collaboration.

Participation in a standardisation process is costly and thus excludes entrepreneurs. This hinders their access to standardised products and services.

When a product or service is developed – often through public private collaboration on innovation – there is still a long way to access the marketplace, also known as the valley of death. Many innovations never reach the users as they fail to establish in the market place. Better access to relevant experience, support for key actors and sufficient funding is needed. Publicly- driven innovation often fails in this phase as it is not sufficiently focused on the value proposition and business case.

## 9 Norway

This chapter presents the study conducted on Norway regarding health innovation in public private collaborations. The main findings derived from the Norwegian study are as follows:

- The Norwegian public and private sector engage in various types of collaboration. Important positive results from collaborating are market expansion, enhanced quality in products or services and improved innovation culture.
- A best practice example of a successful approach to funding public private collaboration in innovation is the newly EU-awarded public research and development contract (OFU-kontrakt).
- There is very limited experience of collaborating with Nordic partners.
- Entrepreneurship from employees in the health sector is not always easy to develop, depending on where the innovative initiative is generated.
- The study indicates barriers to public collaboration on innovation related to the public procurement processes, due to inadequate knowledge on how to use the more flexible mechanisms. In addition, the lack of trust between public and private partners, lack of private venture capital and lack of public measures to stimulate private investments in innovation are perceived as barriers for development of research-based innovation. The study also points to limited resources and lack of incentives to stimulate user-driven innovation.
- The study has highlighted a lack of knowledge-sharing and funds to support projects that cut across the Nordic countries.

### 9.1 Background

The responsibility for delivering health services in Norway is divided between the state of Norway and the 430 municipalities. The state owns the public hospitals. The hospitals are organised into four regional health authorities. The municipalities are responsible for providing primary health care and social services. A lot of positive steps have been taken to strengthen innovation in the health sector in general and the collaboration between public and private parties. This is particularly evident in the clear strategies, public measures and establishment of bodies specialised in enhancing in-

novation that has been based on research and development of networks, which strengthen the interaction between different stakeholders. There is, however, still untapped potential.

This chapter on Norway is based on data from three Norwegian case studies comprising 9 interviews with both public and private representatives, a workshop with 9 health practitioners and a survey distributed among Nordic health experts and practitioners. See Appendix B and C for a description about the data

The three cases that have been conducted in relation to the study on Norway are presented in the following figures. The

#### **“KOLS Heim” – home based treatment for COPD patients**

**The aim** of the project “KOLS Heim” is to reduce hospital admissions for severely ill COPD (chronic obstructive pulmonary disease) patients. St. Olavs Hospital in Trondheim, the local municipality and InnoMed have developed a program for home-based treatment. The main goal is to teach patients to understand their disease and thereby reduce the need for new hospital admissions. The technology is developed in collaboration between SINTEF, St. Olav’s hospital and COPD patients. The project has received funding from Health Mid-Norway and Innomed. The project output are technology and routines that enables COPD patients and health personnel to give sufficient treatment in the patients’ home.

**The main learning point** is that trust between key personnel in the public and private sector is a necessary condition for a successful collaboration. Cultural differences between public and private sector, especially related to problem solving, can prevent the ability to achieve meaningful cooperation. The main barrier has been restrictions relating to exchange of patient information, due to strict rules on personal data.

**Source:** Interviews with Innomed, St. Olavs Hospital

### Oslo Cancer Cluster – dedicated to accelerate the development of new cancer diagnostics and medicines

**The aim** of Oslo Cancer Cluster (OCC) is to improve the lives of cancer patients by accelerating the development of new cancer diagnostics and medicines. OCC is solely focusing on developing new cancer treatments and diagnostics. More than 60 members from all over Scandinavia comprised of small biotechnology companies, large pharmaceutical companies, university hospitals, bio banks and registries, technology transfer offices, academic research institutions and patient groups constitute the OCC. OCC is currently focusing on increasing the member companies' ability to attract capital, creating an efficient clinical trials network to shorten development timelines and building Oslo Cancer Cluster Innovation Park bridging research, biopharma and education.

**The learning point** of OCC is a best practice example on how to combine both local collaboration and international partnership with a vision to be one of the world leading cancer clusters.

**Source:** Interviews with Oslo Cancer Cluster and [www.oslocancercluster.no](http://www.oslocancercluster.no)

### Hospital IT – “Open line – technology supported collaboration”

**The aim** of the project is to reduce the large public expenditure on home health services. Hospital IT, a Norwegian company owned by Lovisenberg hospital and private shareholders, and Lovisenberg Hospital have collaborated on numerous projects. The “Open line – technology supported collaboration”-project is a customer-supplier agreement between the two organisations. The project output is different solutions to simplify home health services. Hospital IT has for the last 3 years been providing patient terminals with solution platforms and software to Norwegian hospitals.

**A learning point** is that long-term relationships between hospitals and suppliers give improved problem-solving. A major issue has been the acceptance of cultural differences in accepting project risk. To get the actors on the hospital side and the actors from the supplier side to approach the complexity of the key issues in the same way has also been an obstacle in the project. Public procurement rules increases the development costs and makes collaboration more difficult.

**Source:** Interviews with Hospital IT, Lovisenberg Hospital

cases demonstrate examples of innovation in ICT, Medical technique and Service.

## 9.2 Public private collaboration

Public procurement is an extensively used method in collaboration between public and private actors in the health care sector in Norway when standardised products and solutions are required. Regulations in Norway do not exclude innovative procurement. Yet, public procurers seldom explore the possibilities of engaging in innovative procurement. The logic of public procurement is that the public should buy from the best and the cheapest tenders. Both the public procurement culture and the centralised procurement function in the specialist health care system challenge the balance between choosing existing large suppliers over entrepreneurs or newly established enterprises.

The Norwegian informants indicate limited experience of pre-commercial procurements. Lack of knowledge and examples of successful or best practice pre-commercial procurement are perceived as obstacles to developing this type of collaboration.

Insights from the study show a tendency towards public private collaboration on innovation when collaborating on challenges and innovations in the health sector. A Norwegian best practice example of a successful approach to funding public private collaboration in innovation is the newly EU-awarded public research and development contract (OFU-kontrakt). Another best practice example is the network InnoMed, which is a national competence network for needs-driven innovation in the health sector.

### 9.3 Cooperation with Nordic partners

The study on Norway has indicated that identifying relevant partners for joint collaboration in innovation projects is not a difficult task. Nevertheless, in practice, the collaboration usually takes place between national actors. The figure below shows that Norwegian innovators primarily cooperate with national actors.

The Norwegian cases all demonstrate a low rate of actual involvement from non-Norwegian participants. The collaborations often seem to be resulting from established relationships between different organisations or people and former experience of collaborating. The networks are often on a local, regional or national level. One explanation for this is that trust between the parties is a particularly important factor to triggering cooperation. Nevertheless, the possibility that the appropriate solution could be used and released both in the national and in a Nordic market is an important driving force for the projects.

In Norway there are several networks where academics, technologists, investors and other relevant actors meet to stimulate innovation in the health sector. Some of the networks are closely linked to the specialist health care services and the universities. Insight from the workshop and interviews indicates that these networks seem highly relevant to stimulating and enhancing collaboration between public and private participants. To bring in Nordic participants is one way of developing the value and potential outcome of the networks.

### 9.4 User-driven methods

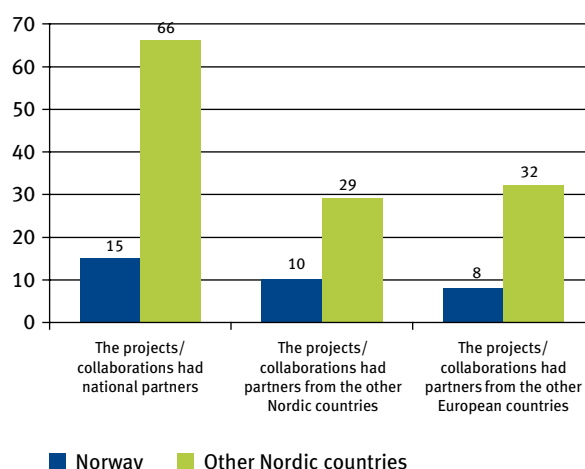
The survey has shown that user involvement is included in projects within health care innovation to various degrees in Norway, see figure 9.2.

Knowledge of users' visible needs from dialogue and regular contact with users are included in the projects, but the study also indicates that the Norwegian informants have experience of applying more structured methods such as market analyses or prototype testing.

### 9.5 Entrepreneurship

The Norwegian informants have indicated that entrepreneurs are included in health innovation projects based on a specialisation that provides added value to the project. Nevertheless entrepreneurs experience different barriers to developing their innovative ideas. Insights from the study have also indicated that the focus on the price in public procurement processes makes it hard for entrepreneurs to participate in public tenders.

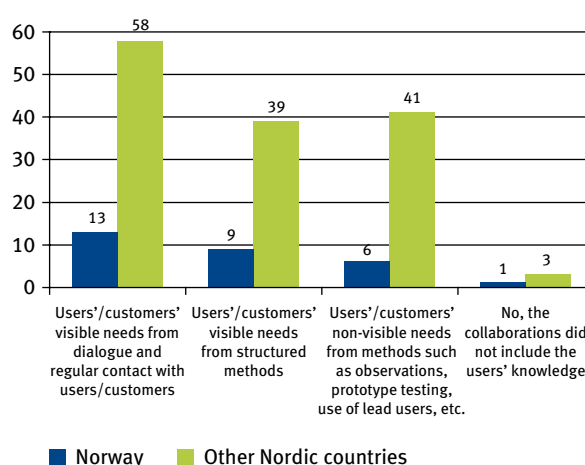
Figure 9.1 Collaboration with national and foreign partners



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Norway is subtracted.

Figure 9.2 User Involvement



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Norway is subtracted.

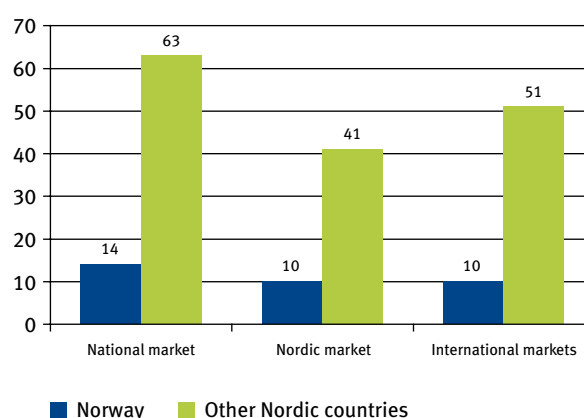
Regional institutions are set up to facilitate commercialisation of products and services based on research results in the hospitals and universities.<sup>7</sup> These institutions build expertise for intellectual property rights, standardisation and commercialisation, and bring together research knowledge, technology competence and commercial stakeholders. Further professionalisation of these types of collaboration will enhance the possibility of developing entrepreneurship based on research. From a health worker's point of view, it might be perceived as difficult to further develop innovative ideas that emerge from their day to day work. Culture and conditions at the hospitals do not necessarily support entrepreneurial activities. The health care sector may provide better framework conditions to support this type of entrepreneurship. Idépoliklinikken at Oslo University Hospital is one promising example of best practice in this area.

Participants at the workshop pointed out that the national health authorities have begun to make demands of entrepreneurship standards for research activities and research output in the health care sector. This will force the health care sector to work more actively to improve framework conditions for entrepreneurship and to produce innovative solutions.

## 9.6 Access to market

Public procurements do not exclude foreign bidders to participate in the competition, but national language and design requirements can still be perceived as barriers to foreign bidders. The same applies to Norwegian suppliers on the international market. The survey indicates that Norwegian respondents have experienced barriers to entering the Nordic market. The case studies have shown that public private collaboration projects, also in Norway, tend to be national and, to some extent, even local in their development set-up. The aim of the projects is often to solve a generic problem, but the development of the solution often takes place in a local setting. Very few projects consider the Nordic potential and thus do not include a Nordic perspective in the design and development phase. The survey indicates that the national market most often is the target for the projects, see figure 9.3. However, the impression from the cases, the workshop and the interviews are that if the solutions are successful, it would of course be possible to launch the solutions both nationally and internationally.

Figure 9.3 Target markets



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Norway is subtracted.

## 9.7 Barriers and potential

The Norwegian informants have pointed to various outcomes of increased public private collaboration. The private sector highlights particularly good opportunities to expand on the national and Nordic market, which represent great potential for collaboration. Furthermore, they have learned that collaboration gives expanded knowledge of users and enhanced networking between public and private organisations. The public sector highlights that the quality of products or services were improved in a way they could not have done themselves, and that they have experienced an improved innovation culture.

However, the Norwegian informants stressed the perception of lack of flexibility in laws and regulations, especially the regulation of public procurements, and cited this as a barrier to public private collaboration. This seems to some extent due to inadequate knowledge on how to use the more flexible mechanisms and a tight focus on costs in the procurement processes, rather than actual lack of flexibility in the regulations. There seems to be a lack of strategic and long-term thinking in public procurement processes, with a culture among public procurers to focus on cost-saving. Additionally, there is a lack of knowledge and best practice examples on the use of pre-commercial public procurements.

7) Called Technology Transfer Offices (TTOs)

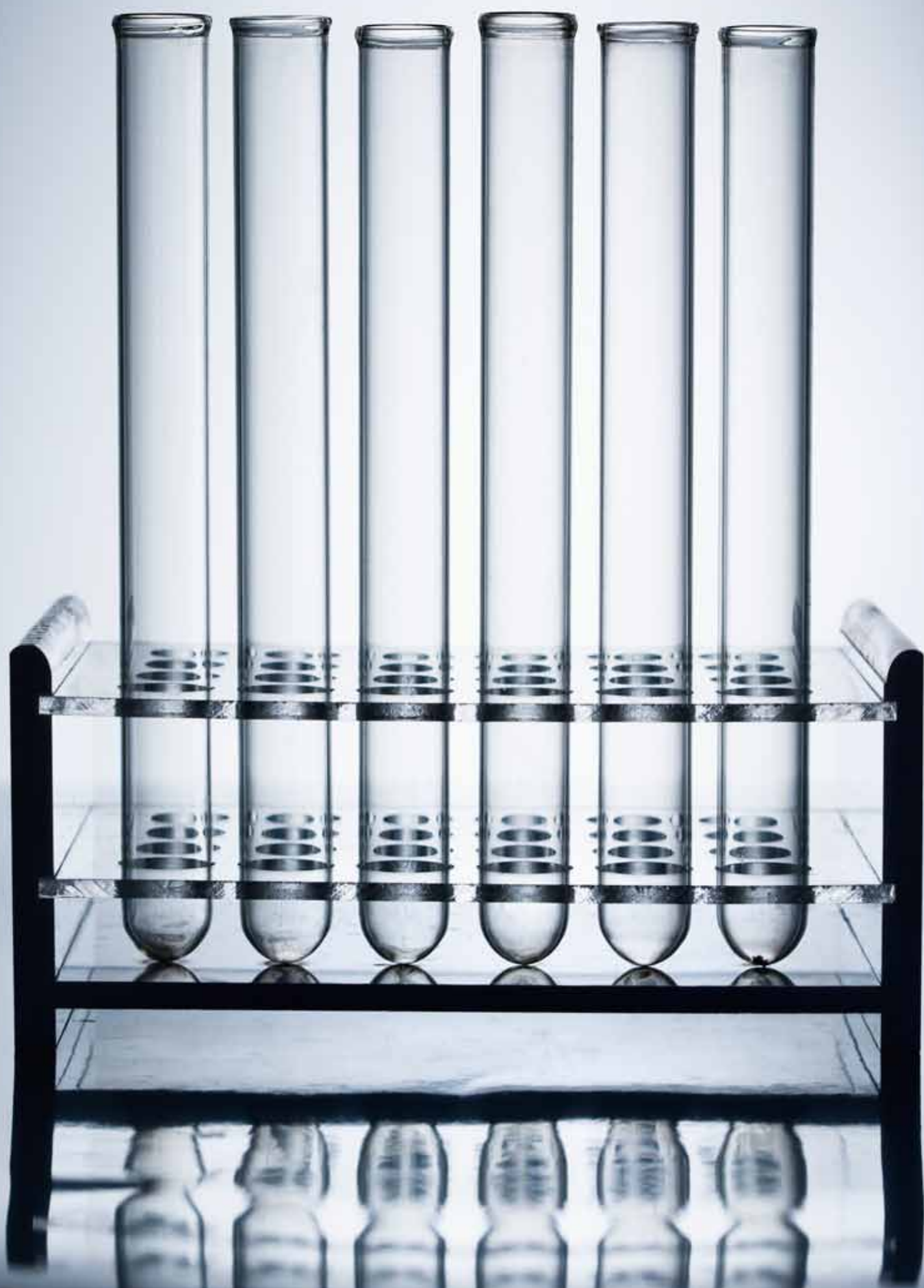
A challenge for further development of research-based innovation seems to be the lack of trust between public and private partners, as well as perceived conflicting agendas between private partners, hospitals and researchers. The study also points to a gap in access to finance in the early stage of commercialisation. Lack of private venture capital and lack of policy measures to stimulate private investments in medical technology, bio technology industry and life science are also barriers for development.

Inadequate time and resources for innovation for clinical staff is perceived as a barrier for development of user-driven innovation. In addition, there is a lack of incentives in the health care institutions to stimulate this type of innovation and entrepreneurship. The informants believed that health authorities should to a greater extent outline measurable indicators for innovation and entrepreneurship in the health care institutions to increase awareness of the results related to entrepreneurship. Matching researchers and business developers with comparative skills may be more fitting in a Norwegian setting.

The Norwegian health care and social sector experience limited exposure to competition. Most of the services are provided by the public sector. Only a few health care and social services are outsourced to the private sector which hampers innovation and public private collaboration.

Another barrier relates to innovation policy and funding measures tending to follow regional or national borders. Lack of funds or programs to support projects that cut across the Nordic countries is perceived as being a barrier for promoting Nordic collaboration. The study highlights a lack of knowledge-sharing across the Nordic countries and also lack of interest or incentives to cooperate across the Nordic countries.





# 10 Denmark

This chapter presents the study conducted on Denmark regarding health innovation in public private collaborations. The main findings derived from the Danish study are as follows:

- Public private collaboration on innovation is seen as a useful way to develop new innovative solutions in the Danish health sector. The main barrier is to bring new solutions to market and to integrate new solutions in the organisation.
- Public procurement is chosen when standardised products and solutions are needed. Public procurement however often poses challenges to the outcome of public private collaboration in innovation projects due to risk of disqualification of the private partner in the process of a public tender.
- The Danish study shows limited experience of collaborating with Nordic partners on health innovations.
- User-driven methods are an important part of public private collaboration on innovation projects and the health care sector encourages these methods.
- Entrepreneurs are not a common partner in Danish public private collaborations on health innovation. The logic of public procurement is part of the explanation. There is however evidence of entrepreneurial spin-offs from innovation projects.
- Potential in collaborations between public and private relates to the improved quality of products that could not have been achieved without collaborating, as synergies from participants are pooled and exploited.
- The main barriers to innovative solutions relate to procurement practices that focus intensively on price. Barriers to increased collaboration across the Nordic countries are lack of knowledge on Nordic markets.

## 10.1 Background

The Danish health care system consists of many different actors. The Ministry of Health as the supreme health author-

ity defines laws and regulations within the health sector. It is however, the five regions in Denmark that are the key actors as they are in charge of running the public hospitals and they are responsible for health staff. Denmark's 98 municipalities provide health services such as home help for the elderly as well as preventive health schemes for Danish citizens. Today around 25 pct. of all public welfare services are handled by private suppliers.<sup>8</sup> Because the Danish municipalities and regions are responsible for the operation

### Medical services of the future

**The aim** of the project "Medical services of the future" is to develop guidance on how to integrate the two organisations – the private emergency medical service and the public emergency room. The goal is to establish a "one-stop shop" for patients and to oblige the need for more doctors in the North Denmark Region and recommendations on physical planning, organisational changes and new IT-systems which will serve as input to the region's tender for an architectural competition and future restricting process. The project was co-financed by The Danish Enterprise and Construction Authority.

**Lessons learned** from the project relates to how the restructuring of a public service provided by both public and private actors have benefitted from collaboration. The project mainly focused on providing the Region with inputs on user preferences that could be used in an architectural tender for the design of the emergency room. Whereas the region got useful inputs, the wider potential in the project has proven limited and there has been limited evidence of implementation of the recommendations.

**Source:** Interviews with the Region of North Denmark and Workz A/S

8) DI (2010): Offentlig-privat samarbejde – Redegørelse 2010.

of the Danish health care sector, they are important public partners in most Danish public private collaborations on innovation in the health care sector.

This chapter on Denmark is based on data from three Danish case studies comprising 6 interviews with both public and private representatives, a workshop with 7 health practitioners and a survey distributed among Nordic health experts and practitioners. See Appendix B and C for a description about the data.

The three cases that have been conducted in relation to the study on Denmark are presented in the following figures. The three cases represent examples of ICT, Health services and Medical techniques.

## 10.2 Public private collaboration

The study on Denmark has its main focus on public procurement and public private collaboration on innovation. The modes of collaboration have been central in the cases, the survey results and at the workshop, and are thus the focal points in the following chapter.

The insights from the study shows that public private collaboration on innovation is a form of collaborating that presents great potential when it comes to identifying new solutions to old problems in the health sector. The benefit of this type of collaboration is that the participation of all stakeholders concerning the development of a new health solution or product are present, thus leading to better results.

### iHospital

**The aim** of the project iHospital is to develop a pervasive IT-system for interactive operation plans, operation rooms and IP- telephones ensuring efficient communication and coordination between doctors, nurses and other health personnel participating in operations. The project started off as a research project stretching from 2003-2006 involving Horsens Hospital, Center for Pervasive Healthcare at Aarhus University and the company Medical Insight. The project was funded by the participants with minor funding from the Danish Agency for Science, Technology and Innovation.

**Lessons learned:** The project is a best practice example of how collaborations between public and private actors can lead to better products and solutions for the public sector while creating business opportunities for the private partners involved. The collaboration resulted in a spin-off as the company Cetrea was formed to commercialise the project. The products are used by several hospitals in Denmark, where it has resulted in better and more efficient treatment of patients and thus hospital capacity. Exploiting the market potential in the Nordic countries is the next step.

**Source:** Interviews with Cetrea and Horsens Hospital

### Bathrooms for everyone

**The aim** of the project Bathrooms for everyone is to design a bathroom for people with functionality issues that would meet their needs and preferences for a bathroom and not solely specifications of a work-environment for health personnel. Participants in the project include a wide selection of stakeholders concerning a bathroom with both private and public partners. The project was co-financed by The Danish Enterprise and Construction Authority.

**Lessons learned** from the project relates to finding a better way to organise public services provided for people with functionality issues which can be met by bringing together stakeholders involved in providing, using and supplying bathroom facilities. The solution is much sought after by the users, and also the elderly homes wish to acquire the new solution, however, public buyers are limited to choose from products defined by large contracts /agreements and so the concept has not been implemented yet.

**Source:** Interviews with Danish Technological Institute and Aarhus Municipality.

Public procurement is considered a useful way of interacting between private and public partners when standardised products and solutions are needed. The logic of the public procurers in Denmark ensures that the public buys the best and the cheapest tenders. However, the study also shows that this logic poses challenges to the outcomes of public private collaborations on innovation, because the outcomes are not always able to meet the dominant requirement of achieving the lowest price in procurement processes. Another challenge is that the private company involved in the development process in the public private collaboration, which then has specific knowledge and experience of the product or solution, may lose the ability to continue the work on it because another supplier underbids it in a tender process. This may affect the successful completion and implementation of the health product or solution.

### 10.3 Cooperation with Nordic partners

The study shows that identifying relevant national partners to collaborate with on innovation projects in the health sector is not a difficult task. The participants on innovation projects are usually a result of existing networks and previous collaborations. The Danish cases all demonstrated a very low rate of actual involvement from participants that were not from Denmark. However, all actors expressed a wish for a larger degree of Nordic orientation in the projects and thus also the inclusion of Nordic partners in health innovation projects. The inclusion of Nordic partners in particular

was pursued by the private sector due to a larger market perspective this inclusion could open up to.

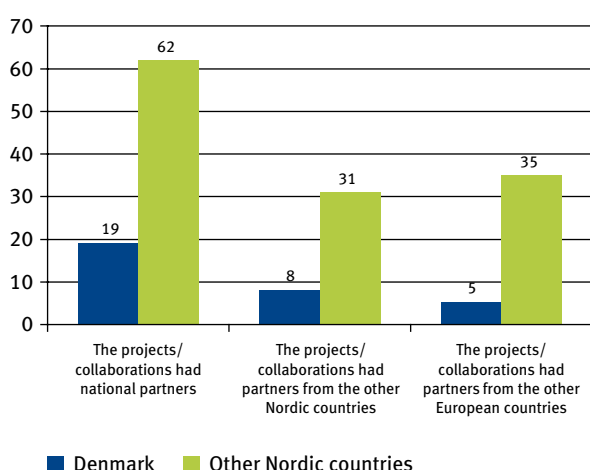
The same seems to be the case for the other Nordic countries, where most survey respondents have replied that they collaborate with national partners, see figure 10.1.

On a regional level in Denmark the international orientation gains ground as there is cross-border cooperation in the development of new and innovative health solutions. In particular, the capital region cooperates with the region of southern Sweden (Skaane), and the Region of South Denmark cooperates with the region of northern Germany. Despite great potential in the cross-border collaboration, the participants in innovation projects consider it more complex if Nordic partners are included and other Nordic users and markets are considered.

### 10.4 User-driven methods

Users are to a great extent included in public private collaboration on innovation in the Danish health care sector, and the study shows that many different methods are at play. The methods range from the mere inclusions of users to more advanced and structured user-driven methods. Figure 10.2 highlights the answers provided by survey respondents.

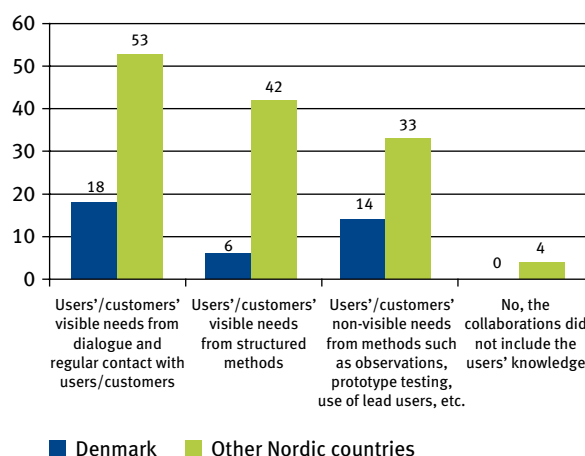
Figure 10.1 Collaboration with national and foreign partners



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Denmark is subtracted.

Figure 10.2 User involvement



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Denmark is subtracted.

According to the study, public private collaboration on innovation is highlighted as a form of collaboration that encourages user-driven methods. All cases demonstrated examples of thorough methods for user involvement and highlighted its positive effect on innovation outcome.

According to the informants, public procurement as a form of collaborating is less supportive of the inclusion of users in the development process because of the focus on price rather than quality that to some extent comes from including user needs. Innovative user-driven products therefore often do not survive the procurement processes in the public sector. However, it was also highlighted at the workshop that it is the desire to include users as part of the procurement processes when deciding which tender to award a contract to.

## 10.5 Entrepreneurship

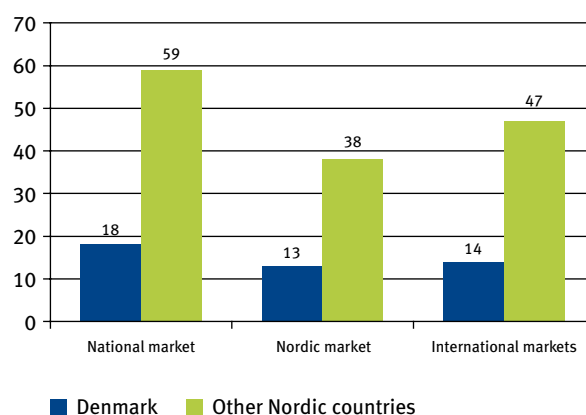
The study on Denmark shows that it appears to be less common to include entrepreneurs in health innovation projects compared to the other Nordic countries. The insights from the study indicate that the focus on the cheapest alternative in public procurement processes makes it hard for entrepreneurs to participate in public tenders as their capability of delivering large quantities in order to drive the costs down and provide a lower price is limited.

The study further showed that in public private collaboration on innovation the inclusion of entrepreneurs is not a problem as long as they have a specialisation that offers specific value to the project. On the other hand, since entrepreneurs have limited means of finance, it requires that they contribute with manpower or that finance is found through other sources. Furthermore, the cases demonstrate a bottleneck in regard to innovation and development projects involving the public sector. A hospital for instance cannot continue a project after the development phase and at the same time be responsible for its commercialisation. Thus it requires that the private part in the collaboration continues with the project or that an entrepreneurial start-up is a spin off from the project.

## 10.6 Access to market

The survey shows that Danish health care products and solutions target both the national, Nordic and international markets though with an emphasis on the Danish home market, see figure 10.3.

Figure 10.3 Target markets



**Source:** Survey on public private collaboration in the Nordic health sector 2010.

**Note:** The figure shows the number of respondents that have answered the question. The other Nordic countries refer to the total from the remaining 4 Nordic countries when Denmark is subtracted.

Insights from the study show that most public private collaboration on innovation projects tends to be focused on the national market. This is also supported by the tendency towards having primarily Danish partners involved in the development phase and thus from the off-set there is a strong focus on the national context and market. In relation to this, it was noted that the Danish innovators believed that the developed health solutions were relevant mainly in a local context, hence limiting a market potential beyond the national borders of Denmark from an early point in the process.

## 10.7 Barriers and potential

The Danish study on public private collaboration in the health care sector shows that both the private and public actors experience benefits and potential when collaborating on health innovations. In particular, the informants from the public sector accentuated that collaborations help improve work processes and enables a new approach to public services. The private sector emphasises that collaborations with the public sector enables more information on users and an expansion of network which is also useful for future projects. Additionally, a benefit of collaborating is the improved quality in products that cannot have been achieved without collaboration. According to the actors, the greatest potential of the Nordic market is the similarity between the countries health systems. The language, culture and the organisation of the welfare and health systems with government funded health care are seen as assets.

However, there are barriers which make it difficult to reach the full potential of health innovation both in Denmark, but to an even larger extent across the different Nordic coun-



tries. The three main barriers that were highlighted in the Danish study are presented below.

Limited knowledge of national laws and regulations in the other Nordic countries is a barrier to cooperation across the countries. Specific insights on practices in the health sector in the other Nordic countries are time consuming to obtain for outsiders, but crucial in the approach to the other Nordic markets.

National standards in Denmark constitute a barrier to the implementation of new and innovative health products and solutions. It requires resources to negotiate standards to include new specifications allowing implementation of new health products. Additionally, there is a complexity of standards across the Nordic countries which also pose a challenge to Nordic collaboration.

Lack of strategic and long-term thinking in procurement processes is a barrier to innovative health products and solutions. The focus on the lowest price in procurement processes and not the long-term potential savings and increased quality, to some extent exclude innovative solutions and products from procurement processes.

Danish innovation funds are primarily targeted at national projects. There is a great variety of public funds available to support health innovation projects in Denmark however these funds predominantly focus on the national context in Denmark and thus provide funds to projects that cater to the Danish market. The tendency that “funds follow the country” prevents collaboration across borders.



# 11 Health Innovation across the Nordic Countries

This chapter presents a cross-country analysis based on the findings in the chapters on the individual Nordic countries. The chapter sums up the findings and highlights similarities and differences in the Nordic countries when it comes to types of collaboration, cooperation with Nordic partners, entrepreneurship and gender issues in addition to potential and barriers to public private collaboration on innovation. The main findings from a cross country perspective are as follows:

- Public procurements are to a large extent used when it comes to procurements of standard products and solutions, but none of the countries seem to have further experience of using public procurements to stimulate innovation. The countries have less experience of pre-commercial procurements. Public private collaboration on innovation projects see increased focus.
- Most of the public private collaboration projects take place on either a regional or a national level within the different countries. The study shows that none of the countries have extensive collaboration across national borders when it comes to public private collaboration, except from Iceland.
- User involvement is an important part of health innovation and public private collaboration on a Nordic basis. Several of the national cases show examples of developing solutions based on users' or consumers' perspectives using various degrees of user-driven methods.
- Entrepreneurs experience barriers to participating in public procurement processes in all of the countries because of tight focus on price. When it comes to public private collaboration on innovation the entrepreneurs seem to be included on the basis of skills and knowledge.
- Except from Iceland, target markets for health products or services are mostly the national markets. This is explained by the fact that the innovations are considered only to be relevant in a local context and to some extent that there are barriers towards entering the Nordic market.
- Barriers to innovation and public private collaboration are to a large extent the same across the Nordic countries. The study points to a perception of a lack of flexibility in law and regulations (and/or the knowledge of how to use some of the more flexible mechanisms), and structural barriers, especially regulation of public procurements, as an important barrier in several of the

countries. Furthermore, inadequate economic conditions and support systems to enhance collaboration are also highlighted as a barrier to public private collaboration in several of the countries. The study also implies that lack of knowledge-sharing across the Nordic countries constitutes a barrier to further development of innovative solutions in the health care sector and that collaboration is hindered by lack of trust between the public and private sector. The study points out complexity in standards between the Nordic countries as a main barrier to developing the health sector and the market through Nordic cooperation.

## 11.1 Public private collaborations

The Nordic countries have experience of several types of public private collaboration. As expected, public procurements play a significant role in the interaction between public and private sector when it comes to procurements of standard products and solutions in all the Nordic countries. It seems however that none of the countries have a widespread culture of using public procurement processes as a way to stimulate innovation. The study implies that there is limited strategic thinking on innovation when it comes to public procurements, and that tight demands on costs may constitute a barrier to both innovative solutions and entrepreneurs. As far as revealed through this study, none of the Nordic countries have significant references from pre-commercial procurements. It seems to be a potential to further explore more innovative public procurements and pre-commercial procurements across the Nordic countries, and to exchange knowledge and examples of best practice.

A positive observation from the study seems to be that there is in fact some experience of public private collaboration on innovation projects in all the five countries. Innovation perspectives and public private collaboration on innovation are high up on the Nordic and national political agendas. A lot of positive steps are taken and most of the countries have systems or policy measures to enhance innovation and public private collaboration on innovation, increasingly also at the primary care level. Nevertheless, the study has revealed that public private collaboration initiatives or activities to some extent are fragmented, and dependent on the work of certain organisations' or individuals' enthusiasm. Also, there seems to be limited exchange of knowledge both nationally and between the Nordic countries.

## 11.2 Cooperation with Nordic partners

Most of the public private collaboration projects take place on either a regional or a national level within the different Nordic countries. The study shows that none of the countries have extensive collaboration across national borders when it comes to public private collaboration, except from Iceland where health innovators seem to have an international orientation. Most of the policy measures aiming at stimulating innovation and public private collaboration are set up on a regional or national basis. And organised innovation networks consist mostly of public and private national actors. Despite lack of practical collaboration, insight from the national workshops and the interviews reveals a willingness to collaborate across the national borders.

## 11.3 User-driven methods

The study has indicated that user-driven methods are an important part of health innovation and public private collaboration on a Nordic basis. Several of the cases across the countries show examples of development of solutions based on users' or consumers' perspectives and feedback. The study demonstrates that the degree to which users are involved in innovation processes varies ranging from the mere inclusion of users to more advanced and structured user-driven processes. Furthermore, the study has highlighted that in the Nordic countries there are some experiences of including users as part of procurement processes when selecting tenders.

## 11.4 Entrepreneurship

The study shows that public private collaboration in innovation can be an important driver for entrepreneurship. Several companies are born of a public private collaboration, either as a spin-off of new solutions developed in the public sector, or because the private actors have approached the public sector when they have a new business idea. Entrepreneurs are included in health innovation projects with their participation being based on competencies and skills. Entrepreneurs experience different barriers to develop their innovative ideas depending on their organisational perspective. Entrepreneurs who have an academic research foundation seem to have better access to networks and funding for further developing their ideas compared to entrepreneurs who do not have this foundation.

In several of the countries entrepreneurs experience barriers to participating in public procurement processes. Requirements concerning the capability of delivering large quantities and securing years of services tend to exclude them from public procurement processes. Finland has taken some steps to assist entrepreneurs and make their access to market easier. It is done through information, development of

networks and by giving the procurement responsibility to a private actor which serves as an integrator for other service providers. Additionally, there is coordinated action to get several entrepreneurs to make bids for tender as a group.

Insight from the study implies that the issue of intellectual property rights varies from country to country. The study on Denmark noted a challenge related to commercialisation of innovation generated in a hospital, as hospitals in Denmark cannot be responsible for commercialisation of products. This has not been highlighted to the same extent in the other countries. In Norway there are organisations aiming to facilitate commercialisation of research results in universities and hospitals that have been established to overcome some of the barriers related to commercialisation of research-based innovations.

## 11.5 Gender

The issue of gender and its effect on health innovation was remarkably similar in all the Nordic countries. The study shows that gender is not considered an issue or a barrier to public private collaboration on innovation. Instead there is an emphasis on selection of collaboration partners based on skills and qualifications, and not on gender. The study illuminates that the gender-division for public private collaborations within health care projects overall tend to be equal, though with a slight tendency towards having more men than women on the projects. The study further shows that there is an overall awareness of gender issues and that the countries strive to have both genders represented in health collaborations. However, the equal participation of gender is second to ensuring the right competences on the innovation team.

Compared to other sectors, the health sector has a high percentage of female employees. Stimulating innovation, entrepreneurship and public private collaboration in this sector will thus also be important in a gender perspective. In primary care services the female share of the employees is particularly high. Stimulation of user-driven innovation, especially in the primary care sector, will thus probably stimulate a higher share of female entrepreneurs.

## 11.6 Access to market

The study illuminates that the target markets for health products or services are national markets, even though the national markets in the Nordic countries are rather small. Iceland seems to differ from the other countries with a slightly greater attention to the Nordic or wider international markets. This is explained by the fact that Iceland has a more limited national market than the other Nordic countries and thus consider other markets from an early point.

The study points to some considerations to why markets beyond the national market are not targeted. Reasons are that the innovations are considered only to be relevant in a local context and to some extent that there are barriers towards entering the Nordic market. Market access is also hindered because of a national oriented mindset in the Nordic countries towards health solutions and products developed in another Nordic country. These health solutions are not considered appropriate when they have been invented outside the national context.

The dominant national orientation is also reflected in the tendency to involve national partners in collaboration on health innovation.

## 11.7 Barriers and potential

Overall, and across the Nordic countries, there was consensus concerning the potential of public private collaboration on health innovation. The public sector experience is such that the quality in products and services is improved through the public private collaboration, in a way they could not have done themselves. Both the public and private informants believe the collaboration processes help to improve their work processes and their innovation culture. The private sector also pointed out that they had expanded their network of public and private organisations and the knowledge of users relevant to future innovation projects through the collaboration. Despite positive outcomes on several elements, the study shows mixed results on whether or not

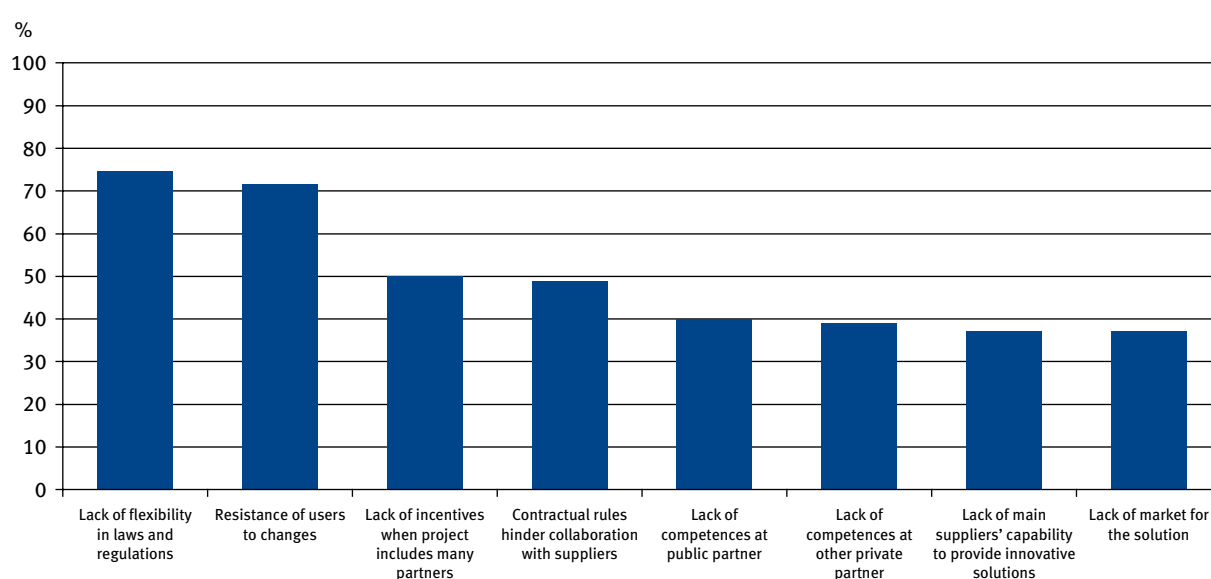
the collaboration made the organisations involved more economically efficient. It seems to be a challenge to reflect positive outcomes on knowledge, network, processes and solutions, in economic results.

Participants in the study underlined that there is potential in seeking innovation opportunities across the Nordic countries. The countries have a good foundation for cooperation because of their similarities; the language, culture and the organising of the welfare systems with government funded health care. However, there are barriers that need to be dissolved to fully exploit the potential in health innovation both within the countries, and across the different Nordic countries. Findings from the survey on external barriers to collaboration on a Nordic level are shown in figure 11.1.

The survey points to lack of flexibility in law and regulation, resistance of users to change and lack of incentives when project includes many partners as the top three external barriers to public private collaboration. The study as a whole points mainly to a broader set of barriers, including both internal and external barriers to collaboration.

In all the countries **lack of flexibility** in laws and regulations and contractual rules, and structural barriers, especially regulation of public procurements, is highlighted as a main barrier to public private collaboration, both in the survey and in the national workshops and cases. There seem to be a lack of strategic thinking in public procurement processes as it focus intensively on price and not necessarily the best solution in a long term perspective. The procurers are not always skilled enough to predict the innovation needs before

Figure 11.1 External barriers to collaboration – Nordic level



Source: Survey on public private collaboration in the Nordic health sector 2010.

Note: Lack of market for solution was only an option for private respondents.

contracts are signed. In addition traditionally procurement culture and budget restrictions often give a narrow focus on cost saving. Public procurements processes are to a limited extent used to strengthen innovation, and adapted processes like pre-commercial procurements, are rarely used in the health sector. This limits innovation and entrepreneurship. It is often claimed that the perception of regulations being a barrier is more often than not a barrier than the actual regulation. The study reveals a need for development of knowledge and exchange of best practices within innovative public procurements in general and pre-commercial procurements in particular.

**Economic conditions** are also highlighted as a barrier to public private collaboration in several of the countries. In general, the study points to lack of budgetary funding as an internal barrier for innovation. There are not sufficient amount of funding available to support aspiring health innovation. The focus of the discussion about economic conditions differs in the various countries. In Finland there is a more out-spoken discussion about tax issues and also a need for policy measures to support public private collaboration. In Norway lack of venture capital and policy measures to stimulate private investments (e.g. tax schemes) in researched based innovations are highlighted. Across the countries the study points to the fact that funding is targeted at national projects and lacks a focus on Nordic perspectives. Introduction of competition and access of new actors may be another way to stimulate innovation with scarce public resources.

Another factor that gets attention across the Nordic countries as a perceived internal barrier to public private collaboration is lack of trust between the public and private sector. Lack of trust is probably an indication that public and private sectors have little information about each other rather than an actual problem of trust. Public private collaboration involves complex incentives structures and trust is a key to creating successful public private partnerships. Information-sharing and building of trust through networks and projects may contribute to lower perceived barriers to collaboration, both nationally and on a Nordic level.

The study implies that **lack of knowledge sharing** across the Nordic countries constitutes a barrier to further development of innovative solutions in the health care sector. This issue has been pointed out in several of the national workshops and interviews. Diffusion of knowledge between practitioners in the Nordic countries is perceived to be insufficient. Furthermore, there is an overall lack of knowledge on details and specifications in the health care set up in the individual Nordic countries that are crucial when developing health solutions and products with a potential across the different Nordic countries. Systems and networks for information exchange and knowledge building are needed to enhance innovation in the sector.

The study also raises a barrier concerning **the use of standards**. When innovative health products and solutions are developed, existing standards often constitute a barrier to its implementation. New approaches to existing problems are rarely possible with the specifications of existing standards and it thus requires negotiations on re-definitions on standards to enable the implementation of a new health product or service. This complication is even more complex in a Nordic setting where standards to a large extent are national. This barrier to developing the Nordic health market and strengthening the Nordic health industry should be dealt with on a Nordic level. For entrepreneurs it is costly to participate in the development of new standards and as a result often offer products that do not comply when new standards are implemented.

## 12 Policy recommendations

The study on health innovation and public private collaborations shows that the Nordic countries have initiated a large number of interesting initiatives, collaboration and innovation activities at all levels. The Nordic countries are in a unique position with their mainly public and tax-financed health systems to take a coordinated view on challenges, problems and solutions and to coordinate the efforts at the national and Nordic levels. There is a potential to become the attractive frontrunners in the field of health innovation that we need to be.

However, the study also provides inspiration to a number of recommendations on new initiatives, which we believe must be implemented if the Nordic countries should really exploit their future potential with regards to health innovation.

We emphasise a need for action in areas where there is a lack of initiatives or where programs or initiatives do not function optimally. On this basis nine recommendations targeted at the national and Nordic levels emerge from the study. The connection between the results of the study and the challenges, potential and recommendations is summarized in the table below.

| Result – challenges and potentials                                                    | Recommendations                                                  |
|---------------------------------------------------------------------------------------|------------------------------------------------------------------|
| <b>National focus</b>                                                                 |                                                                  |
| Great potential for the health systems to drive innovation                            | Implement strategic procurement through health innovation demand |
| Public actors are uncertain about how to use pre-commercial procurement               | Clarify rules on pre-commercial procurement                      |
| There is lack of finance for and focus on commercialisation and implementation        | Emphasis on commercialisation and implementation                 |
| <b>Nordic focus</b>                                                                   |                                                                  |
| Access to the Nordic market takes a lot of time for new solutions and entrepreneurs   | Simpler permission for new health solutions                      |
| There is little incentive and funds for Nordic health innovation projects             | Collaboration among National and Nordic funding institutions     |
| Potential in exploiting and cross-fertilizing competences across the Nordic countries | Link health clusters on Nordic commercial platforms              |
| Difficult approval of research projects                                               | Cooperation among ethical committees                             |
| Many great examples to be spread in the Nordic countries.                             | Best practice sharing and health innovation statistics           |
| Lack of knowledge about the impact of organisation on health innovation level         | New inspiration on international models of health innovation     |

## 12.1 New initiatives for health innovation

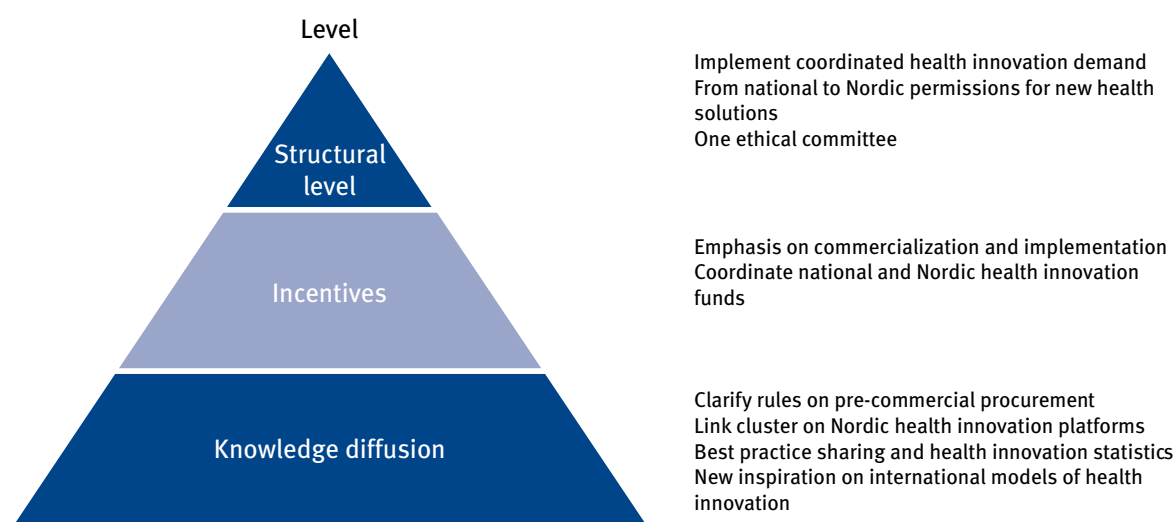
Initiatives on a political level can be divided into three different layers, where the political measures differ.<sup>9</sup> In the top layer, this analysis has discovered that there are structural barriers to public private collaboration on innovation on a Nordic level. Furthermore, the analysis points to the fact that there are little or few measures in the second layer concerning incentives to Nordic collaboration. Furthermore the funds and financial support is to a limited extent focused on commercialisation and implementation which is needed to be a success. At the third layer, the analysis shows that there is a lack of knowledge, especially regarding possibilities and diffusion of best practice among the Nordic countries.

The recommended initiatives and their placing in regard to the three layers of instruments are shown in the Figure below.

Furthermore there are many actions that private and public actors can take without political intervention. Actors can coordinate efforts through voluntary networks but also on establishing new standards that promote innovation.

The study reveals various specific instruments and actions taken in the Nordic countries. The chart below provides examples of these existing policy measures. The new initiatives we recommend shall not replace but complement or strengthen the impact of the existing measures.

Figure 12.1 Layers of instruments and the suggested measures



9) Christensen & Petersen: Regulering, af udlicitering og offentlig-private partnerskaber (OPP) i danske kommuner i *Politica*; 2010; NiCe (2006): The role of the public sector in innovation policy

Chart 12.1 Examples of policy measures in the Nordic countries

| Present measures                                       | Iceland                                         | Finland                                                                                                                                      | Sweden                                                                                                                                                                | Norway                                                                                                                                                         | Denmark                                                                                                                                                                 |
|--------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Programmes and funds                                   |                                                 | Innovationer i social- och hälsovårdens service system: €240 mio. 2008-2015.<br>Wellbeing through innovation – FinnWell €150 mio. 2004-2009. | Innovationer for Fremtidens Helse SEK600 mio. 2008-2013; Innovationsslussar inom hälso- og sjukvården SEK40 mio. 2009-2013; Kronisk inflammation SEK85 mio. 2008-2012 | Generic programmes:<br>Norges Forskningsråd: NOK409 mio. for health in 2008;<br>OFU-ordningen, NOK60 mio. for health in 2009.<br>InnoMed: NOK12,6 mio. in 2008 | Council for Science and Technology<br>Fornylsesfonden DKK 760 mio. (Welfare 25-50 %) 2010-2012<br>PWT foundation DKK 3 billion 2010-2015.                               |
| Network                                                |                                                 | ForumVirium Helsinki<br>BioCenter Finland                                                                                                    | Karolinska Institutet innovation System<br>Stockholm- Uppsala Life Science Cluster                                                                                    | Kommunernes Sewntralorganisasjons' Innovasjonsalliance<br>Oslo Cancer Cluster                                                                                  | Carenet, Center for Sundhedsteknologi, SundhedsITnet, Biologue, BioSys<br>Welfare Tech Region (South Denmark)                                                           |
| Knowledge diffusion and advice centres                 |                                                 | Institutet för hälsa och välfärd – THL<br>Helsinki Living Lab                                                                                | Karolinska Institutet Innovation System<br>Idépoliklinik Sahlgrenska Hospital                                                                                         | Idépoliklinik Oslo Universitetssykehus                                                                                                                         | Center for Sundhedsinnovation<br>InnovationCenter Copenhagen<br>MidtLab at Region Midtjylland<br>The regions establishing a national laboratory for welfare innovation. |
| Commercialisation – incubators and technology transfer | Health Tech Incubator Innovation Centre Iceland |                                                                                                                                              | Karolinska Institutet innovation System                                                                                                                               | Invent2<br>Innovest                                                                                                                                            | Regional and university based technology transfer units<br>Idéklipnikken at Aalborg Hospital                                                                            |
| Education and competence                               |                                                 |                                                                                                                                              | Karolinska Institutet innovation System                                                                                                                               |                                                                                                                                                                |                                                                                                                                                                         |

## 12.2 National recommendations

Though health innovation has been an important topic for policy measures in the Nordic countries in recent years, the study shows that there are still many potential initiatives which can be taken at the national level in order to strengthen innovation in the health area. Also, there is a lot to learn for the actors across the Nordic countries. Below we describe the recommendations targeted at the national level and we provide information on best-practice examples from individual countries which may inspire the other Nordic countries.

### ***Implement strategic procurement through health innovation demand***

The focus on public private collaboration on innovation in the health sector mainly stems from the ministries of business affairs as well as from actors at regional or local level who in recent years have been putting an even stronger emphasis on the issue. Among the ministries of health the focus is vaguer and the issue has been quite recent. In several Nordic countries there will in the years to come be significant investments in the health sector, new hospitals etc. This could be a major driver for innovation in the private sector as well as for developing new solutions which enhance effectiveness and quality in the public sector if innovation becomes a central focus for the national investments.

For this to be realised, it is necessary to work systematically and coordinated with the creation of a demand for innovative and new solutions in the health sector. Our study shows that the ministries of industry and the ministries of health as well as the institutions at the regional level develop strategies and set up programmes and initiatives in a way that is not sufficiently coordinated. Many resources being spent on health as well as on business oriented projects may be wasted on that account as the demand for innovation and new solutions is not coordinated and in place in the health sector. The way forward is to coordinate health innovation strategies with institutions at all levels and in the different sectors to work together to establish a demand for health innovation in the health system. On the daily operative level there is a need to integrate purchasing departments and the development departments more effectively. It is important to set a political vision, set specific goals and integrate them in the organisation.

### ***Clarify the rules on pre-commercial procurement***

Pre-commercial procurement in the health sector could have a large impact on the functioning of the public health sector. Pre-commercial procurement has not yet been exploited in most European countries. The workshops and interviews in the Nordic countries in this analysis also point to the fact that many actors are not fully aware of how to conduct pre-commercial procurement. Therefore, we advise the countries to clarify and communicate the rules on pre-commercial procurement. A way to do this is to make guidelines and examples of contracts which are easy to use for public buyers.

#### **Best practise: The Region of Southern Denmark**

In collaboration with Kammeradvokaten – the legal adviser to the Danish Government – the Region of Southern Denmark is now preparing a script for how the region can prioritise both price (labour) savings and innovation gains in its procurement and still be legal according to the EU procurement directive

#### **Best practise: Iceland**

In Iceland RANNIS has been involved in driving innovation and pre-commercial procurement by investing in new solutions for the public sector. E.g. RANNIS has helped financing the first buys of new innovative products for public hospitals from Icelandic companies in order to demonstrate the functioning of the product before marketing the product in foreign markets.

#### **Best practice: Norway**

Public research and development contracts involve committed and focused cooperation between industry and government to develop and deliver a new product or solution. A condition is that there is a public need that cannot be satisfactorily met by existing services and products. The product or solution must be developed and produced in Norway.

### ***Emphasis on commercialisation and implementation***

In most countries there is access to public funding to research projects regarding new health solutions. However new solutions usually need a proof-of-concept that is application in practise, before the market and private investors are willing to take the risk of investing in or buying new solutions. This is in economic literature termed “The valley of death” and signifies a deadlock after research and development. Hence there is a risk that public investments in research and new private innovative solutions never generate the return that is possible. There is a need to emphasise the effect measured in actual implementation of innovation processes. Many funded projects are never integrated or implemented in the organisation and actual learning is limited.

We propose that the Nordic countries support the new solutions in the pre-commercialisation and implementation phase. National and regional public innovation programmes shall require that public private collaboration on innovation projects’ that they co-financed shall document the expected outcome and how they will implement it or how it can be sold on the national or Nordic market. And there should be more emphasis on project activities in the implementation and commercialisation phase. Projects should be responsi-

#### **Best practise: Business Innovation Fund**

Denmark has in 2010 established a new fund, which has an interesting focus on promoting new welfare solutions and help them through the difficult pre-commercialisation phases. The fund is aimed at bridging the valley of death and use new financial instruments such as market maturation programmes and guarantees for new solutions. This makes the fund one of the first of its kind in the world in supporting the commercialisation phase.

#### **Best practise: Karolinska Institutets Innovation System**

The institute has established a recognised and leading centre of commercialisation of research and business opportunities within health care. The institute provides a complete network of experts, organisations and services that offer full support throughout the entire process – from the very first seed of an idea to something which one day could be a new pharmaceutical drug or a new medical technology product. This includes evaluation, patenting and business development, start-up and seed financing, access to a large national network of venture capital companies as well as well-established contacts with the international pharmaceutical and biotech industry and an active network of experienced project leaders, R&D experts, business developers and professional consultant

ble to deliver feedback to the programmes on best practice, barriers etc. There should be evaluation on programmes in a Nordic context in order to learn from similar projects in all of the Nordic countries, and learn about potential new collaborations across the Nordic countries.

Knowledge diffusion and networks are important for the development of a sector and for diffusing new practises and organisational methods to be implemented in the public sector. However knowledge diffusion networks and knowledge-sharing regularly become irrelevant if they do not demonstrate their added value. Today there are several networks and knowledge diffusion centres in the Nordic countries.

A significant way to demonstrate added value is to link network and knowledge-sharing to commercial outputs. Therefore we propose that network and knowledge diffusion units are based on units that focus on commercialisation in terms of getting access to venture capitalists, develop a business case etc.

specific measures to exploit the potential. To make sure that new Nordic initiatives proposed can work effectively we follow a set of guiding principles:

- Nordic initiatives must encourage to go Nordic in cases where there is a value added of collaboration with Nordic partners instead of national partners.
- It is necessary to align new initiatives with the already existing innovation system in the individual countries.
- Specific measures must be based on detailed knowledge on strongholds, clusters and opportunities in the Nordic countries and implemented in correspondence with that knowledge.
- Nordic initiatives must aim to strengthen Nordic health innovation, as there seems to be many national and cross-border programmes and initiatives but a lack of infrastructure supporting Nordic collaboration.

#### ***Collaboration among National and Nordic funding institutions***

In most Nordic countries there is funding present for basic research, applied research, innovation and collaboration in national or regional programmes. Within public-private health innovation the Nordic funding is limited and actors have little incentive to public private collaboration with partners in other Nordic countries. Nordic collaboration across borders and languages, with longer distance and more part-

### **12.3 Nordic recommendations**

The studies and workshops in the Nordic countries indicate that there are important measures that the Nordic countries can take together to strengthen health innovation in the region. However, a political vision is important to implement change throughout five different countries. We propose that the Nordic countries make a strategy with clear goals and

ners is far more complex, expensive and risky. If there is no financial support, cross-fertilization across strong clusters and competence centres in the different Nordic countries will only happen to a limited extent. This is a general trend across all interviews and workshops in the Nordic countries.

Therefore we propose to strengthen the incentives through an integration of the Nordic health innovation system. We propose to open national initiatives for co-financing Nordic public private innovation projects. Practically, this could happen by making Nordic projects eligible at the national programmes, making Nordic calls or to prioritize Nordic projects and communicate these possibilities to actors. This would ensure substantial funding. At the same time the Nordic initiative will be aligned with the existing Nordic innovation system and that Nordic projects only are chosen when they have more perspective than national projects.

It will be difficult and a large coordination effort. It is necessary to describe potential programmes thoroughly. The report “Helseinnovasjon i Norden” by NICE maps initiatives in the Nordic countries, but there will be a need to identify and compare application criteria, target group, focus areas, decision processes etc. for each programme. Realisation implies a thorough anchoring, political back-up and active involvement of each of the Nordic countries. As part of this effort we also advise the Nordic countries to cooperate on how to use the possibilities of funding through the European framework programmes to fund innovation.

### ***Simpler permission for new health solutions***

Today the Nordic market for health innovation is difficult to address for producers of new solutions and technologies. It is not uncommon within health care that it takes 3-4 years from when the supplier has the first contact to a potential public customer before the first solutions can be delivered. This is a problem for all kinds of companies, but especially for SME's that do not have the financial strength for such a long waiting time. The first barrier is that new solutions for the health sector must be approved by the approval bodies before they are allowed to get access to the market. For pharmaceuticals and medical equipment it is necessary that products and solutions are thoroughly tested before they are approved while others have more easy access. The area is complex and there are different requirements for different products. Permission by The European Medicines Agency gives access to all European countries, but in other areas there are different authorised bodies with different procedures and standards which often make it difficult for companies to get access to other countries, because the standards for approval differ. Furthermore there is national approval for some solutions. Especially for entrepreneurs, this means that the Nordic market is limited.

We propose to implement a simpler model for permitting new health care solutions to be used within the health sector in the Nordic countries. We propose that the Nordic countries work together to find a simpler model by standardising

procedures and processes among approval bodies. Furthermore the Nordic countries can collaborate to make sure that approval of products - where national approval is still the case – gives access to all Nordic countries. This should be done in close collaboration with the EU because much of this area is regulated by the EU, but also in close collaboration with the industry in order to make sure that approval procedures are simple and easy.

### ***Cooperation among ethical committees***

Innovation projects and research projects within health from time to time involve clinical trials, patients and personal information from diagnostic examination and other delicate data collection processes. Today several committees in every country must approve health innovation projects in the public sector. In this present study several actors from different kinds of projects have experienced waiting time because of getting permission from different committees and bodies like the ethical committees or data protection agencies. Waiting time and inconsistency in permission practise often is a barrier in national projects. And in Nordic projects it is even more difficult because this implies applications in different countries. This is a challenge to be met at clinical trials but also on projects involving access to information about patients.

We propose to make it easier to conduct Nordic health research and innovation projects by opening up for Nordic research and innovation projects by establishing a Nordic ethical committee for Nordic projects.

### ***Link clusters in Nordic commercial platforms***

In the various countries, there are different clusters and strongholds in the health industry. But if the Nordic countries within this field are to be a globally leading region in health innovation, the competition on a global scale will become even tougher. This implies that the best people and the best companies ought to work together. Often because of lack of knowledge and too much complexity, companies in one country do not find the right partner in another country. Furthermore, health solution companies to a large degree sell through commercial partners with access to and knowledge about the public market in the health sector. This means that many developers are detached from knowledge about buyers and users which decouples the market mechanism and the free flow of knowledge about what is technically possible and what is needed.

Today there are clusters organisations present in the Nordic countries with knowledge on the national competitive strengths that would be able to bring people together. Therefore we propose to map clusters, competences and actors in the Nordic countries as a first step. The next step would be to link cluster organisations or other driving actors through networks or through a Nordic conference for actors within health innovation across the Nordic countries. In order to make sure that knowledge on users and needs flow

to the developers, we propose to establish a set of Nordic health innovation commercialisation platforms. In practise this could be based on an ICT platform organised where the public procurement departments can present needs and demands for the market. And companies could present new solutions and make bids to solve the needs of the buyers.

#### ***Best practise sharing and health innovation statistics***

In the Nordic countries, there are a lot of local, regional or national instruments and measures. Some of these instruments are successful and worth spreading to other countries. A lot of the work at the regional or local level has been initiated through agency funding. But it is difficult to ensure spreading of best practise among these actors if they are not linked to each other. A report like this has the objective of spreading knowledge among the actors in the Nordic field. But furthermore there is a continuous need to let best practises flow among actors across borders and organisations if the best results are to be discovered and spread to other entities. This will not happen by itself. It is necessary to have a permanent actor who has this kind of diffusion as purpose.

Therefore we propose that Nordic knowledge diffusion should be ensured between actors. In practise we propose to set up a virtual Nordic Health Innovation Centre consisting of key actors within this field who are to develop and spread knowledge to each other and further to actors in the individual countries. Within the domain of technology transfer offices there is a new initiative regarding establishing a new Nordic technology transfer network, which could prove to be an example of linking initiatives together.

The study of health innovation in the Nordic countries has also revealed that it is difficult to describe and compare the public health systems and the health industry across the Nordic countries because of the poor condition of the available data from the statistical bureaus in the Nordic countries. This contrast the United States for instance where these types of statistics are quite well developed on the basis of guidelines and indicators. Therefore we propose that the Nordic countries invest in establishing a common framework for developing comparative statistical data on the health system and the health industry.

#### ***New inspiration on international models of health innovation***

The Nordic countries are unique in the sense that the health systems are primarily financed from public sources. This is often viewed upon as a strength in the sense that the health systems are easier and cheaper to manage. The United States spends much more on its health system than the Nordic countries. According to the recent OECD statistics 2010c, the United States spent \$7,538 per person on health in 2008, well over double the \$3,000 average of all OECD countries. The next biggest spender is Norway as we have shown in our mapping. But Norway still spent much less than the U.S. per capita.

#### **Best practise: Idea clinics between Oslo, Aalborg and Gothenburg**

The three hospitals Oslo University Hospital, Aalborg Hospital and Sahlgrenska University Hospital in Gothenburg have developed idea clinics which aim to collect, develop and commercialise new ideas from within the hospital, users and relatives. The three clinics have now initiated a collaboration. They have plans to develop common process tools and IT systems to share ideas and experiences. This will give them a user database of 40,000 employees at its three hospitals.

However, we do not know how well the Nordic countries' health systems and industries perform when it comes to managing their health innovation efforts. We know that some of the results of the organisation of the Nordic health systems imply barriers. But we do not know if they are doing better or worse than countries representing Continental-European, South-European, Anglo-Saxon or Asian health care systems and organisational models? If so, the Nordic countries health sectors may lag behind on both quality and efficiency over time.

On this basis we suggest that research of the international models of health innovation is initiated in order to analyse and understand the effect of different organisational models and financing schemes on health innovation.



# Appendix A:

## Mapping of the Nordic health sector

This appendix presents data and the method that was used to conduct chapter 5: Mapping of the Nordic care sector. The mapping is based on the best accessible statistics from both national and international data sources. When conducting the analysis the attempt was made to use the same statistical approach for each country in order to achieve a comparative perspective. The analysis is based on different data sources in order to, on the one hand, give the most detailed and complete picture of the Nordic care sector and, on the other hand, ensure that data is internationally comparable.

Below is an overview and references to the data sources that have been used to conduct the mapping of the Nordic health sector. Comments on the underlying calculations can also be found here.

| Link to data source                                                                                                                                                                                                                    | Remarks/method                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Relevant figures          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Source: Eurostat's enterprise statistics<br><br><a href="http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes">http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes</a>                              | Structural business statistics and external trade                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Figure 5.2 to Figure 5.4. |
| Source: OECD Health Data<br><br><a href="http://www.oecd.org/document/16/0,3343,en_2649_34631_2085200_1_1_1_37407,00.html">http://www.oecd.org/document/16/0,3343,en_2649_34631_2085200_1_1_1_37407,00.html</a>                        | Public expenditure                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Figure 5.1                |
| Source: Statistics Iceland<br><br><a href="http://www.statice.is/">http://www.statice.is/</a>                                                                                                                                          | Enterprises and turnover indicators                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Figure 5.2                |
| Source: Danish Enterprise and Construction Authority<br><a href="http://www.danmarksvaekstraad.dk/file/63780/Analysenotat_vaelfaerdsteknologi_ny.pdf">www.danmarksvaekstraad.dk/file/63780/Analysenotat_vaelfaerdsteknologi_ny.pdf</a> | Calculation based on data from Eurostat's COMEXT database and the OECD ITCS database in November 2009. The export specialization is a ratio calculated as exports of welfare technology divided by total export for the individual country. This is then divided by the same calculation of welfare technology export share in the OECD+ countries. Data is found in the OECD ICTS database and the EUROSTAT COMEXT database. To replicate (or update) the ratio one needs to extract data by CN8 (Combined Nomenclature) code from the COMEXT database, and by HS (Harmonized Commodity Description and Coding System) from the EUROSTAT database. The difficulties in the calculations are in converting the HS to the CN8 nomenclature (because the HS is 6-digit and the CN8 is 8-digit). For a more specific insight into the calculations we recommend you contact the Danish Enterprise and Construction Authority ( <a href="http://www.ebst.dk">www.ebst.dk</a> ). Other: "OECD+" is defined as the joint volume of EU27 and OECD countries. Here we have to disregard Chile and Israel who first became members of OECD in 2010. | Table 5.1 to Table 5.4.   |



## Appendix B: Survey

The purpose of this appendix is to present the method of the survey used in the project as well as to give an overview of the response rate. The survey is not intended to be a representative survey, but is aimed at collecting information from practitioners with a high degree of experience of public private collaboration within the health care sector. The purpose is to qualify the findings from the case studies and workshops with more standardised and comparable data from actors within this field.

The respondents for the survey have been found mainly using desk research and the project team's Nordic network, as well as the task force assigned to this project. The goal has been to identify experts and practitioners within public private collaboration in the development of health innovation solutions in the Nordic countries. The identified respondents represent both the public and private sector.

The survey was distributed among the identified respondents in two rounds. The first round included respondents from all of the 5 Nordic countries, and was distributed on Friday the 6th of august. The preliminary results of this round were presented at the workshops held in the 5 countries. For the second round, more respondents were identified from the 5 countries, and the invitations were distributed on Tuesday the 17th of august. It is the final results of the survey, including both rounds 1 and 2 that are used in the report.

Distribution of the survey is managed through the software program Analyzer, and invitations were sent to the respondents via e-mail. The respondents who did not answer the survey received two reminders via e-mail.

### *Response rate for the survey*

The following table presents the response rate for the survey, which was closed on the 27th of august. 245 respondents were identified and invited to participate in the survey in total. As can be seen in the table 1 below, 89 persons completed the survey, giving a response rate of 36 percent. Table 2 presents the respondents divided by country.

*Table 1: Response rate*

|                             | No.        |
|-----------------------------|------------|
| Respondents                 | 245        |
| Completed                   | 89         |
| Did not want to participate | 8          |
| Did not answer              | 148        |
| <b>Response rate</b>        | <b>36%</b> |

**Source:** Survey on public private collaboration in the Nordic health sector 2010.

*Table 2: Divided by country*

| Country | No. of respondents | No. of completed answers |
|---------|--------------------|--------------------------|
| Denmark | 44                 | 20                       |
| Finland | 64                 | 20                       |
| Iceland | 38                 | 12                       |
| Norway  | 58                 | 17                       |
| Sweden  | 41                 | 20                       |

**Source:** Survey on public private collaboration in the Nordic health sector 2010.



SARST  
SD2112  
6/9-05  
MENNA  
10  
SD2112

SARST  
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G8UC  
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## Appendix C: Case interviews

The purpose of this appendix is to provide an overview of the qualitative sources for the study. This section thus covers how the cases were selected, how the case interviews were performed and reflections on the workshop.

In order to get qualitative information about public private collaborations in the Nordic countries, three case studies were conducted in each Nordic country. The case studies were performed through interviews and supported by workshops held in the five countries. The aim of the case studies was to find best practice examples in the Nordic countries with cases across the four health care fields and types of collaborations, see table 1 below.

In order to find best practice examples, the task force on innovation and entrepreneurship in the health care sector, which has been set up by the Nordic Committee of Senior Officials for Business Policy (EK-NE/Næring), was consulted for national recommendations. This was supplemented with recommendations from experts in the different countries with particular knowledge on innovation and the health care

sector. These recommendations have been used as a background for the desk research which complemented the list of case studies.

From the gross list, 3 cases from each country were selected. The selection was aimed at finding cases which demonstrated different types of public private collaborations and also examples of the various fields of the healthcare, mainly ICT, services, medical technique and bio medicine. The selected cases are summarised in the table below.

2-3 interviews per case study have been conducted with both public and private participants with three case studies per country. This has resulted in a total of 34 interviews in the 5 countries.<sup>10</sup>

Interview respondents representing the cases were selected based on their position and knowledge of the project and collaboration. Thus the interview respondents consisted of project managers or key practitioners. It was ensured that all cases had representatives from both the public and private

Table 1 Fields of healthcare explored in cases study and selection criteria

| Country | Case                           | Solution |          |                |               | Focus                                      |                    |                  |
|---------|--------------------------------|----------|----------|----------------|---------------|--------------------------------------------|--------------------|------------------|
|         |                                | ICT      | Services | Med. technique | Bio. medicine | Public private collaboration of innovation | Public Procurement | Entrepreneurship |
| Finland | Helsinki entrepreneurs         |          | X        |                |               |                                            | X                  | X                |
|         | Kotitori home services         |          | X        |                |               | X                                          | X                  | X                |
|         | Caring TV                      | X        | X        | X              |               | X                                          |                    | X                |
| Sweden  | MobiPen                        | X        | X        | X              |               | X                                          |                    | X                |
|         | NeoDynamic                     |          |          | X              |               | X                                          |                    |                  |
|         | New tools for health           |          |          |                | X             | X                                          |                    |                  |
| Norway  | KOLS Heim                      | X        | X        | X              | X             | X                                          |                    | X                |
|         | Hospital IT                    | X        | X        |                |               | X                                          |                    |                  |
|         | Oslo Cancer Cluster            |          |          | X              | X             | X                                          |                    |                  |
| Iceland | Björkin                        |          | X        |                |               | X                                          |                    | X                |
|         | Nox Medical                    | X        |          | X              |               | X                                          |                    | X                |
|         | Mentis Cura                    | X        | X        |                |               | X                                          |                    | X                |
| Denmark | Bathrooms for everyone         |          |          | X              |               | X                                          |                    |                  |
|         | iHospital                      | X        |          | X              |               | X                                          |                    | X                |
|         | Medical Services of the Future |          | X        |                |               | X                                          |                    |                  |

10) Norway: 9 interviews, Sweden: 6 interviews, Denmark: 6 interviews, Finland: 7 interviews, Iceland: 6 interviews.

side of the collaboration. Respondents thus included doctors, researchers, entrepreneurs, scientists, CEOs, and business managers.

For practical reasons, the interviews were predominately conducted as phone interviews, but when possible face-to-face interviews were also carried out. One interview was done by videoconference.

An interview guide was formulated to structure the interviews and to ensure that the interviews covered the same topics across the five countries. The guide contained six topics:

1. An introduction to the project and the respondent's role in the project
2. The project participants
3. Access to market
4. Potential and barriers
5. The methods used in the project with focus on user-driven innovation
6. Policy measures

Workshops were also held locally in all five Nordic countries. The aim of the workshops was to bring health care experts and practitioners from both the public and private sector to test and validate concepts and findings derived from the study, as well as to provide inputs into solutions and policy recommendations to the identified barriers. Participants for the workshop were invited based on recommendations from the task force and desk research as well as participants from the case study. The participants at the national workshop comprised hospitals, universities, private companies, standardisation bodies, national and regional authorities, innovation centres, research centres, and competition authorities.





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