Adding value to Nordic research cooperation
Recommendations for a new initiative on distribution of health

Distribution of health is one of the challenges facing the Nordic countries and Europe. Although health and life expectancy have improved in the Nordic countries, inequalities in the distribution of health persist. The difference in mortality rates among different socio-economic groups, for instance, has grown greater. Although inequalities in the distribution of health may be viewed as a health-economic problem, this is above all an egalitarian issue related to the future development of the welfare state.

The Nordic countries share common strengths with regard to research carried out in order to overcome health inequalities. The countries have rather similar social structures, and social and health care functions are comparable, which makes it easier to combine researchers' resources and data more successfully. For instance, merging the unique resources found in their national registries could give the Nordic countries a competitive edge in the international research community.

The focus of the "NORIA-net on Health and Welfare" working group, consisting of representatives from the major national Nordic research financiers, was to analyse the position of Nordic research on distribution of health and effective public health interventions in the Nordic countries. The report gives an overview of research activities, funding and funding systems of relevance to research on health and welfare-related issues in the Nordic countries 2005-2010. Based on these findings, the report also provides policy recommendations to Nordic political circles, research funding agencies and NordForsk.

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Preface

NordForsk is an organisation under the Nordic Council of Ministers which aims at facilitating cooperation in all fields of research and research-driven innovation when this adds value to work being conducted in the Nordic region. Priority is given to thorough analysis as a basis for funding of joint Nordic research programmes. Some of NordForsk's preparatory actions are carried out by our "Nordic Research and Innovation Area networks" (NORIA-nets).

The NORIA-net on Health and Welfare was initiated by NordForsk in order to identify research fields in which the research councils and higher education institutions anticipate that Nordic cooperation would add value to present and future research in line with NordForsk's Strategy. It was also seen as highly relevant for the discussion within the Nordic Council of Ministers on a possible future initiative within health and welfare.

The major national research funding agencies in the Nordic countries have participated in this NORIA-net. They unanimously chose "Distribution of Health" as the core focus. The reason was that this topic for several years had been a highly important issue in health and social policies as well as in the research sector. From the start, the group agreed that distribution of health would be a topic of mutual interest for all the Nordic countries, and that there was a need for strengthening Nordic cooperation in this field.

The report gives thorough analysis of health and welfare research in the Nordic countries, and includes recommendations on how to strengthen Nordic research within this field. The recommendations are directed to NordForsk and Nordic research councils as well as to research institutions. It is argued that investments in this field would contribute to the development of both scientific quality and practical use of research results. In addition, it is emphasized that a Nordic initiative in this field has to be long-term (ten years) because only a programme of this duration would guarantee results that will have significant scientific and societal impact.

NordForsk would like to forward our sincere thanks to the enthusiastic and knowledgeable NORIA-net team with Maria Nilsson as the coordinator: Mikael Fogelholm, Chair (the Academy of Finland), Johanne Juhl and Tara Laura Brandt Elvang (Danish Agency for Science Technology and Innovation), Katrín Valgeirsdóttir (Rannís, Iceland), Steinar Kristiansen (The Research Council of Norway), Erland Hjelmquist (Swedish Council for Working Life and Social Research), Arne Jarrick (The Swedish Research Council), and Mats Ulfendahl (The Swedish Research Council). In addition, NordForsk forwards our thanks for an excellent contribution to Dr. Tommi Sulander (University of Helsinki) who was engaged as an expert secretary and was responsible for the literature search and review and for writing the main part of the report.

Gunnel Gustafsson
Director of NordForsk

Summary

The NORIA-net on Health and Welfare group aimed at developing an overview of research, funding and funding systems of relevance to research on distribution of health in the Nordic countries. Based on these findings, recommendations for policy actions were developed and addressed to Nordic political decision-makers, major Nordic governmental research funding agencies and NordForsk. This report is a review of the main scientific research carried out and funding allocated to research on distribution of health in the Nordic countries between the years 2005 and 2010.

The review revealed that a large number of studies on distribution of health have been conducted in the Nordic countries since 2005. The overall message is: the lower the social status, the poorer the health. Most of the research on distribution of health conducted in the Nordic countries in the past five years has been related to issues that had previously been examined in depth. The majority of the studies have been associated with inequalities in mortality, self-rated health and health behaviours, in line with the existing tradition. In contrast, the mapping exercise indicated that there is a lack of data on prospective studies on distribution of health. In particular, almost no experimental or natural intervention studies have been conducted, and this knowledge gap needs to be addressed.

Intensifying and strengthening Nordic cooperation in research on distribution of health would be very beneficial. First, new scientific data could contribute fresh insights to help address this major societal challenge. Second, although the Nordic countries are relatively homogeneous, interesting and perhaps increasing variations do exist, not least due to the impact of migration. The inclusion of similarities and differences would be an asset when combining national data into much larger Nordic datasets. Third, the unique opportunity to use national registries, for instance, would give the Nordic countries an international edge, especially if their resources were combined.

The main proposal of the NORIA-net group is to establish a Nordic thematic research programme on distribution of health, financed in part by NordForsk, but with most of the funding provided by Nordic national research funding agencies. The programme could focus on prospective research and interventions. Since adequate duration is required for prospective studies in the area of distribution of health and welfare to be meaningful, we propose a 10-year research programme. Only a programme of this duration can guarantee results that will have a significant scientific and societal impact.

1. Introduction

... health is related to structural variations in, for example, income, education ...

1. Introduction

Health and life expectancy have improved in all of the Nordic countries and among all the various segments of the population. Despite this positive secular trend, there has been no improvement in the uneven distribution of health. On the contrary, the difference in mortality among different socio-economic groups, for example, has grown greater. Although an unequal distribution of health may be viewed as a health-economic problem, it is – above all – an ethical issue related to justice and equity perspectives. The existing uneven distribution of health is linked to multiple factors, such as education, wealth, living conditions, health behaviour and access to and quality of health services.

Uneven distribution of health is related to structural variations in, for example, income, education, employment conditions and place of residence. Thus, a variety of methods to promote health and interventions to reduce health inequalities will be needed. It is important to understand that the distribution of health is affected by different types of policy, not just health policy. The overarching question is how to use universal and targeted policies and interventions (addressing education, employment arrangements, social protection, the built environment, public health conditions, etc.) to promote equality in health. This knowledge is essential for prioritising recommendations and actions at the regional, national and European levels.

While welfare states provide safety nets, insurance and redistribution, welfare policy may also have an impact on people's incentive to work, invest and save. Political support for the welfare state depends, among other things, on the distribution of income. Gender also plays an important role, as women are strong supporters of the welfare state. The willingness to pay taxes may in turn depend on what the welfare state provides and to whom these benefits are provided. It is important to note, however, that the Nordic welfare state model has been undergoing change in recent years, as indicated by the privatisation of health services, for example.

Although there are a number of different resources that are important in the context of health, economic resources are the most central, as they can easily be transformed into other types of resources. In the Nordic welfare state model, social policy is essential as it can be used to reallocate economic resources directly. Social policy encompasses instruments such as sickness insurance, unemployment insurance, family support and pensions, as well as subsidised or free services such as childcare, health care and care for the elderly (Lundberg et al. 2008).

Research activities and policies related to distribution of health are challenging due to their complexity and multidisciplinary nature. So far, questions in this field have not been adequately addressed in pan-European or Nordic-level research programmes.

Nevertheless, the Nordic countries share common strengths with regard to research carried out in order to overcome health inequalities. The countries share rather similar social structures and social and health care functions are comparable, which make it easier to combine researchers' resources and data more successfully. For instance, use of the countries' extensive registries combined with quasi-experimental community interventions could strengthen the unique expertise among the Nordic countries while simultaneously supporting the role of Nordic researchers and promoting know-how on how to reduce health inequalities in Europe.

During the preparation of different Joint Programming Initiatives (JPIs) (Joint Programming refers to a new concept of European cooperation in research and innovation), a primarily Nordic group led by the Swedish Council for Working Life and Social Research (FAS) and which included the Academy of Finland and the Research Council of Norway, among others, proposed public health and, more specifically, health inequalities as the thematic area for a JPI. The general objective of this proposal was to launch a long-term research programme on public health/inequalities in health, with coordinated actions in a number of European countries. The specific aim was to go beyond descriptive studies in an effort to apply the insights from previous research in the field and to understand health effects and cost effects of interventions and policies. The programme was to be designed to generate deeper insight into knowledge-based policies. However, this proposal was not accepted as an independent JPI.

Despite the fact that the proposed JPI on health inequalities was rejected, health inequalities is still one of the health-related Grand Challenges facing Europe, including the Nordic countries. The aim of the *NORIA-net on Health and Welfare* has been to find out how Nordic research funding organisations, including NordForsk, can strengthen the position of Nordic research on distribution of health and effective public health interventions in the Nordic countries.

The NORIA-net group has compiled an overview of the research activities, funding and funding systems of relevance to research on health and welfare-related issues in the Nordic countries as well as relevant EU activities. On the basis of these findings, the group has drawn up recommendations on policy actions that are addressed to Nordic political decision-makers, the primary Nordic governmental research funding agencies and NordForsk.

This report is a review of the overall scientific research and funding related to the distribution of health in the Nordic countries carried out in the period 2005-2010. The overview is based on a literature review, supplemented by statistics and reports on funding obtained from the Nordic research funding bodies. The project group hired Dr Tommi Sulander to carry out the literature review and to write the main parts of the report.

... draws attention to the relationship between the social and economic conditions ...

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2. Aims, methods and procedures

The aim of the mapping exercise was to gain knowledge about the research itself (where it is conducted, what the main topics and findings are), databases and funding of scientific research on distribution of health in the Nordic countries. This knowledge was then used by the NORIA-net group to formulate recommendations on how to strengthen Nordic research on distribution of health and welfare (Chapter 6).

The scope of the mapping exercise was limited to three primary tasks:

1 To review scientific publications concerning research on distribution of health conducted in the Nordic countries since 2005. Identifying research strengths and weaknesses as well as knowledge gaps was of special interest here.

2 To identify the main databases in each country. This was done by the NORIA-net representatives from each country.

3 To gain an overview of funding and funding systems in order to find out how funding of research on the distribution of health is organised in the Nordic countries in general, and in particular how the multidisciplinary nature of the research is reflected in the funding. This review was supplemented with a survey questionnaire sent to the main Nordic research funding bodies.

This report defines the term *health* in a broad sense in order to encompass inequality studies with all possible health outcomes as well as issues that many people would regard as falling under the term "welfare". The term *health inequality* (or *inequity*) is also a broadly defined term referring to uneven distribution of health in different population groups. Health inequalities are very often linked to socio-economic disparities. In this report health inequality is examined through the distribution of socio-demographic determinants, which draws attention to the relationship between the social and economic conditions under which people live and their health.

Literature review

A review was conducted of scientific studies concerning the distribution of health and welfare in the Nordic countries published since 2005 and found in PubMed and in Social Science Index in June 2010. Several different review exercises were conducted to identify all possible studies that include elements of health inequalities/inequities. A wide scope was chosen in order to also identify studies that did not have the study of inequalities as their primary aim, but whose analyses included results concerning inequalities. Studies using variables of inequality/inequity only as covariates in their analyses were excluded from this report.

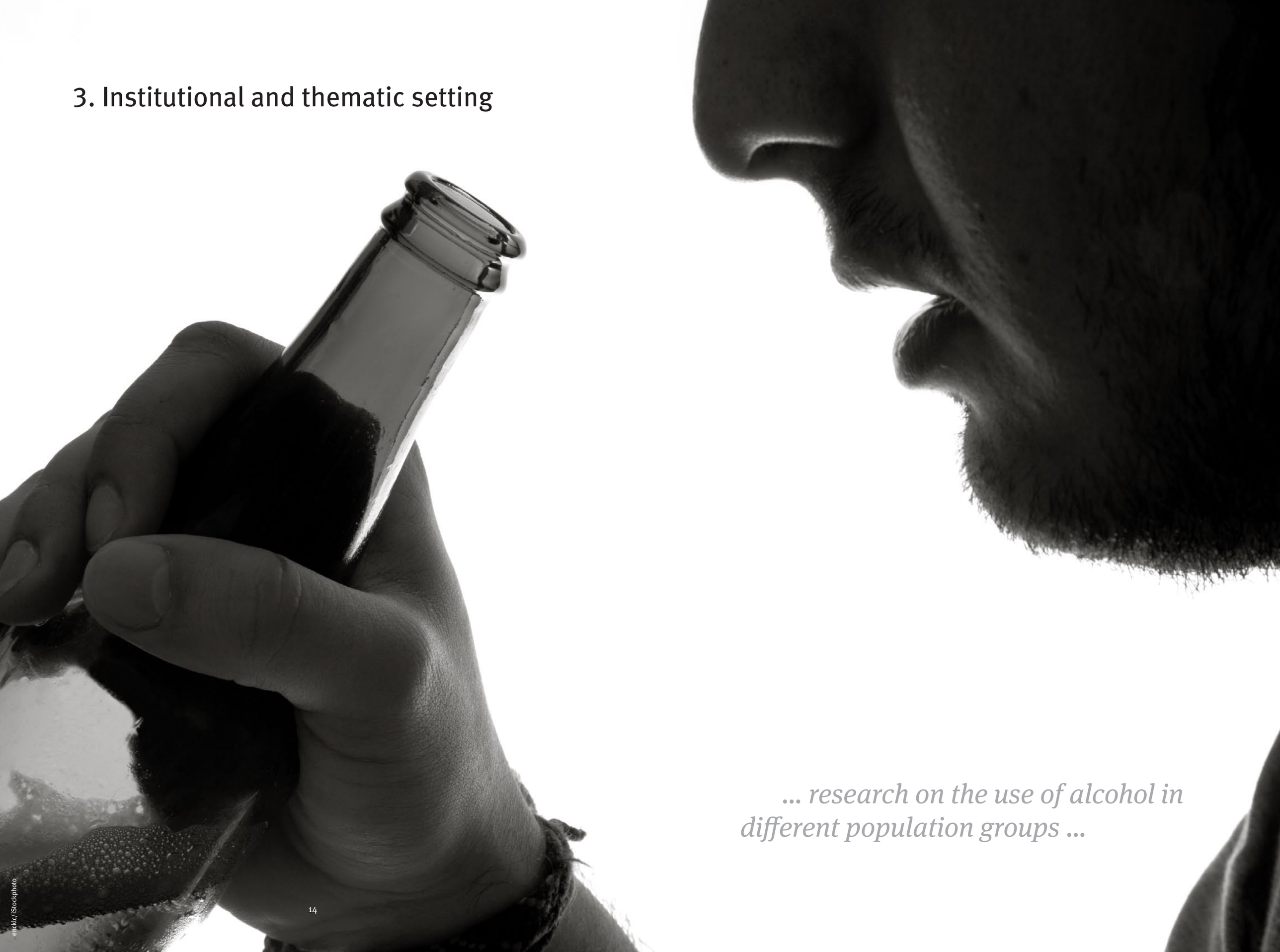
As search engines such as PubMed screen exact words used in the scientific articles, this review included a wide variety of key words concerning distribution of health. Social and economic determinants reviewed were: marital status, education, occupation, income, poverty, housing, environment, neighbourhood and living arrangements. The key words working conditions, migration, social capital and culture were added to this review. All search terms are shown in Appendix I.

The review process was divided into two parts. First a quick scan of titles and abstract levels was performed on the several thousand studies identified by the search terms. At this stage the rough number of identified studies from the various countries was: Denmark 2 000, Finland 3 000, Iceland 200, Norway 2 000, Sweden 4 000. Thus at the first stage more than 10 000 abstracts were scrolled through briefly. Based on this overview, abstracts from studies of health inequalities/inequities carried out in the various Nordic countries were culled for a more detailed examination. All the abstracts that included results on distribution of health were then selected.

Review of the funding sources

The funding review was divided into two parts. First, all existing annual reports, project catalogues and project databases available from governmental funding bodies in the Nordic countries were reviewed. Second, a short survey questionnaire was sent to the representatives of the main Nordic research funding bodies in order to obtain a more complete picture of the funding landscape. (See Appendix II.)

3. Institutional and thematic setting



... research on the use of alcohol in different population groups ...

3. Institutional and thematic setting

This literature review consists exclusively of peer-reviewed research publications. However, it is evident that studies of distribution of health, particularly those involving approaches from e.g. the social sciences, have also been published elsewhere. Specifically, various national reports addressing this issue have been produced and published in the Nordic countries, for example by the Institute of Health and Welfare in Finland and the Swedish National Public Health Institute. Although the present mapping does not cover the entire spectrum of publications, it is still considered broad enough to enable the NORIA-net group to arrive at conclusions and make recommendations.

Institutions that conduct studies on distribution of health

The literature search identified over 1 000 studies on distribution of health carried out in Nordic countries between 2005 and 2010. Approximately 20% of these studies were from Denmark, 25% from Finland, 15% from Norway and 40% from Sweden. Only a few dozen studies were conducted in Iceland. In each country, most of the studies on health inequalities were published by only a few institutions (Table 1), indicating that research on distribution of health is not very widely dispersed.

Table 1: Approximate percentage of studies conducted in different institutions by country. Iceland is excluded because of the limited number of studies carried out there.

Country	Institution	Percentage
Denmark	University of Copenhagen	20%
	University of Southern Denmark	15%
	Aarhus University Hospital	10%
	Institute of Cancer Epidemiology at the Danish Cancer Society	10%
	National Institution of Occupational Health	10%
Finland	The National Institute of Health and Welfare	25%
	University of Helsinki (Dep. of Public Health and Sociology)	25%
	National Institute of Occupational Health	10%
Norway	University of Oslo	20%
	University of Bergen	20%
	National Institute of Public Health	15%
Sweden	Karolinska Institutet	40%
	Lund University	15%
	University of Gothenburg	7%
	Uppsala University	7%

Research focus in various Nordic countries

In all the Nordic countries most of the studies undertaken on distribution of health used traditional indicators of socio-economic position (SEP) such as education, occupation and income. Studies of the association between working conditions and health also provided valuable information. Health disparities related to marital status have also been examined to some extent, but not as frequently as traditional SEP indicators.

The Nordic countries had many shared elements in their research areas but there were also some areas of divergence. For example, studies concerning immigrants are rare in Finland, while research on the use of alcohol in different population groups is particularly prevalent.

The health of immigrant groups has been studied more in Denmark than in the other Nordic countries. To give another type of example, socio-economic disparities in injuries and the incidence of automobile accidents have been studied somewhat more in Sweden than in the other Nordic countries, as have self-rated health and musculoskeletal morbidity.

Nordic collaboration on research devoted to distribution of health has been limited. Most of the collaborative studies have been carried out in the areas of cancer mortality and preterm birth (foetal growth). Individual national studies have covered issues such as bullying, child well-being, smoking, the use of dental and general practitioner services and psychosomatic complaints (Pedersen et al. 2005; Virtanen et al. 2006; Virtanen et al. 2007).

Main databases

The NORIA-net representatives were responsible for gathering database information from their own countries. As samples, major databases from Denmark, Finland and Iceland are shown in Appendix III. The Nordic countries have well-established registry-based systems that are used in studies on mortality, for example. Some studies on distribution of health and welfare have linkage to registry-based data. All of the countries maintain national, regional and local datasets.

Main study designs included survey-based cross-sectional and follow-up results, registry-based follow-up results, registry linkage results and results combining survey responses and individual clinical measurements. The reason for the popularity of registries and survey studies is quite obvious. Registries give very precise information on health outcomes and various aspects of inequality. However, registries do not supply more detailed information. Surveys, in contrast, contain indicators of general health and lifestyle, which are not possible to identify through registries. Furthermore, surveys are not restricted to a specific health outcome, such as mortality. Surveys often have a low response rate, which increases the likelihood that results may be somewhat biased. Nevertheless, surveys are often the only available method of gathering more precise information on health and health-related issues within the population.

4. Distribution of social and health factors in the Nordic countries

... people with a higher educational level are more likely to quit smoking than those with a lower level ...

Peeter Viisimaa /iStockphoto

4. Distribution of social and health factors in the Nordic countries

This section presents main findings on distribution of health and welfare based on scientific international peer-reviewed journal articles. A complete reference list of all the studies reviewed may be accessed via the NordForsk website: *www.nordforsk.org/en/publikasjoner.* Table 2 summarises the main health outcomes studied in the Nordic countries. As the number of studies from Iceland was low, it was not possible to identify a clear pattern of outcomes. Therefore, Iceland is not included in the table.

Mortality and morbidity

Research concerning *mortality* was mainly based on registry follow-up studies and linkage data based on survey and registry information. A study from Norway showed increasing inequalities in mortality over the past few decades (Strand et al. 2010). The overall message concerning mortality is the well-known fact that people with lower social status have a higher mortality rate than those who are better off. Furthermore, mortality among disability pensioners has been shown to be higher than among old-age pensioners in Norway and Sweden (e.g., Gjesdal et al. 2009a; Gjesdal et al. 2009b; Gjesdal et al. 2009c). In addition, people who live alone or are unmarried have a higher mortality rate than their married counterparts.

Particularly substantial social inequalities were found in relation to external causes of death. Life-course effects have been studied by using childhood social position or even grandparents' social positions as the social determinant. The study populations were mainly middle-aged, with some elderly people included. A few studies from Finland show a higher incidence of mortality among the Finnish-speaking population compared to the Finnish-Swedish-speaking population (e.g. Sipilä and Martikainen 2009). This variation seems to be strongly linked to the different socio-demographic and health-behavioural backgrounds of these two population groups.

A few studies in Norway and Sweden have examined mortality and social mobility (Claussen et al. 2005; Tiikkaja et al. 2009). These studies indicate that people moving upwards in the social hierarchy have lower mortality rates than their class of origin but higher rates than their class of destination. A corresponding pattern has been found for people who move downwards. Furthermore, cardiovascular disease (CVD) mortality seems to be clearly structured by adult social class, but not as consistently structured by childhood class. The mediating role of education suggests that a major part of life-course disadvantages or advantages in relation to CVD can be ascribed to the educational level achieved (Tiikkaja and Hemström 2008; Tiikkaja et al. 2009).

The extensive Nordic Occupational Cancer (NOCCA) project covering all the Nordic countries, and using registry data, concluded that the risk of *cancer* is highly dependent on the person's social position (Pukkala et al. 2009). Direct occupational hazards explain only a small percentage of the observed variation – albeit a large number of cases – while indirect factors such as lifestyle changes related to a longer education and decreasing physical activity have become more important.

Although there is evidence that people with lower socio-economic status have a higher overall mortality and overall cancer mortality rate, a closer examination of the cancer mortality rate reveals, for instance, that breast cancer is more common among more highly educated women in many European countries including Denmark, Finland and Norway (Strand et al. 2007). However, in Denmark and Sweden the survival rate after a breast cancer diagnosis is also higher in socio-economically advantaged groups (Carlsen et al. 2008; Eaker et al. 2009). High SEP groups receive a cancer diagnosis at a less advanced tumour stage and may also be given more aggressive treatment once the diagnosis has been made. Most cancer types are more prevalent among lower social classes and people with a low educational level. This indicates that also mortality studies should focus more on different causes of mortality than on overall mortality.

Registry-based studies on *suicide* from Denmark, Finland, Norway and Sweden have concluded that the risk of suicide is higher among working-aged people who have a lower social status. Also some evidence from Iceland suggests that community household poverty increases the risk of adolescent suicidal behaviour (Bernburg et al. 2008). A study from Sweden suggests that various indicators of childhood poverty are related to subsequent suicide risk (Rojas and Stenberg 2010). Another study from Sweden shows inequalities concerning attempted suicides among individuals above 70 years of age (Wiktorsson et al. 2010). Attempted suicides are more common among those who have less education, are unmarried or are living alone.

Inequalities in *obesity* have been studied in Finland and Sweden, in particular. These studies clearly show that employed and older people with less education and lower occupational status have a higher incidence of overweight and obesity than others. This pattern is especially apparent among women. Children living in families with a lower SEP are also more often overweight and obese than those living in higher SEP families. Results from the other Nordic countries indicate similar results to those obtained in Finland. In Sweden some immigrant groups have a higher prevalence of obesity.

The incidence of *type 2 diabetes* exhibits an inequality pattern similar to that of obesity, especially among working-aged men. Some evidence suggests that among older adults, diabetes is more common among less-educated women. The pattern may be the reverse among men, but not enough studies have been carried out to give a clear picture.

Self-rated health, health-related quality of life and prevalence of poor health have mostly been studied using cross-sectional surveys. Some longitudinal survey studies have been conducted as well. The overall message is clear: the lower the social position, the poorer the health. The most widely studied age group was 20-to-64-year-olds, although some studies, especially in connection with health-related quality of life, have focused on older adults. The most common determinants of poor self-rated health were financial strain or low income and being unemployed. Various studies identified immigrant background and being unmarried as predictors of poor health. Neighbourhood characteristics, social capital and SEP were associated with health and quality of life. Low social capital and low-area SEP were associated with poorer self-rated health and cardiovascular mortality.

People who are cohabiting with a partner in mid-life constitute the marital status category that is least likely to show cognitive impairment in later life (Håkansson et al. 2009).

Cross-sectional and longitudinal surveys and surveys combined with registries have provided the main sources for studying *disability pension* and long-term *sickness absence.* Sickness absence is more common among those with a low level of education and low occupational status. This pattern has been found in Denmark, Finland, Norway and Sweden, while sickness absence has not been studied in detail in Iceland. Poor working conditions with high job strain and a heavy workload are associated with sickness absence.

Women appear to have a higher prevalence of sickness absence than men which may be partly explained by the mother staying at home when the child is ill. There is also indication that disability pensions are more prevalent among those with lower SEP. A heavy physical workload is also associated with poorer self-rated health and poorer physical functioning. The incidence of mental disorders seems to follow a somewhat similar pattern. Studies on disability pension have primarily encompassed middle-aged people whereas sickness absence studies have concentrated on employees of all working ages.

In Sweden various studies on *musculoskeletal disease and neck, shoulder and back pain* have been conducted, using primarily cross-sectional surveys and concentrating on working-age population. Adverse psychosocial conditions were mentioned as a determinant more often than physical workload. A low level of education and income is a predictor of poorer musculoskeletal conditions. The same pattern has been observed in Norway. However, physical job demands and job autonomy explain a substantial proportion of occupational class inequalities in self-reported musculoskeletal pain in the working population.

Mental health problems have been studied by both longitudinal and cross-sectional designs using surveys, sometimes combined with registry data. Studies concerning mental health have focused on middle-aged subjects and, to some degree, on children and adolescents. There is evidence from Finland indicating that past and present economic difficulties are associated with poorer mental health. However, this pattern is not equally clear when examining disparities using traditional SEP measures. An association between low education and burnout has been found among Finnish women, but not among men. Working-aged Finns who live alone appear to suffer more from depression and anxiety. Severe mental problems are more prevalent among immigrants and people with a low education or low income. Poor mental health is also common among the unemployed and the single. Some less severe mental health problems are found to be more common among highly educated people.

Inequalities in *oral health* have been examined in a few studies carried out in different Nordic countries through the use of cross-sectional and longitudinal designs using surveys or registry/survey linkages with clinical examinations. The age groups studied were mainly the elderly and children or adolescents. Results from Norway indicate that lower income is associated with poorer oral health. However, income disparities in oral health have been decreasing in Norway over the past few decades. A few studies from Finland have shown the same inequality pattern according to education. Studies from Denmark and Sweden also confirmed that being unmarried and having an immigrant background are determinants of poorer dental health.

Health services and use of medication

Use of or access to health services has been studied to some extent. There is some evidence from Norway that children with highly educated parents have better access to specialised health care compared to those with less educated parents. Registry linkage studies from Finland indicated that people with a higher income have better access to surgery. Children from less educated families in Finland and Norway use dental services more often compared to children from highly educated families.

In Denmark and Sweden, most studies assessing social inequalities in access to health care services were based on cross-sectional surveys. However, a few studies also used registries and one study with a longitudinal design was identified. In general, people with a high level of education and income had better access to health care and higher referral rates to specialised care. Some studies from Sweden indicated that socio-economically disadvantaged population groups, such as the unemployed, had

a greater need for health care services but sought and received less care compared to the socio-economically advantaged groups. One study from Denmark reported that unmarried people and disability pensioners made more frequent use of primary health care. Educational level was also associated with patient satisfaction with the care provided.

Cross-sectional surveys were also used to study *medication use*. Polypharmacy and inappropriate drug use were more common among the group with low education. The association between SEP and prescribed drug use varied by drug type. Infants were more likely to be treated with antibiotics if the parents were immigrants, while use of antibiotics in adults was more common among the high SEP groups. Psychotropic drug use was more common among lower SEP groups whereas the use of lipid-lowering drugs and of newly marketed drugs in Sweden, and complementary and alternative medicine (CAM) in Denmark, was more prevalent among higher SEP groups.

Studies on *pregnancy outcomes* such as preterm birth and small size for gestational age, as well as infant mortality, have mainly made use of registry data and cross-sectional designs although a few longitudinal studies have been conducted as well. A low level of maternal education, low social class, single motherhood and, somewhat less clearly, low family income were associated with poorer pregnancy outcomes. This evident social inequality has proved to be an increasing trend.

Risk factors

Most of the studies in Finland that examined inequalities in *health behaviour* focused on *alcohol consumption* and physical activity. Food habits or diet were also studied to some extent. The vast majority of health behaviour studies have been based on cross-sectional surveys, so there is a lack of longitudinal results. Alcohol consumption has been studied in great detail in Finland during the past five years as the alcohol tax in Finland was lowered substantially in 2004. Most of these studies have examined increasing alcohol-related mortality figures as well as SEP disparities in hazardous drinking. It is well known that alcohol use is greater among those with a higher level of education than those with less education, but there are different drinking patterns as well. Nevertheless, results indicate that heavy drinking and alcohol mortality have the most powerful impact on people with a low education, low income and low occupational class. Some studies have also shown that unemployment and living alone are associated with heavy drinking and alcohol-related mortality.

Physical activity has been studied primarily by cross-sectional surveys. Evidence from studies in the Nordic countries suggests that people with a higher educational level are more physically active than their less educated counterparts. However, in a few studies from Finland no clear educational disparities in physical activity were noted (Mäkinen et al. 2009; Mäkinen et al. 2010a). On the other hand, occupational disparities were found. Manual workers (particularly men) and workers with high job strain (women) were less physically active than their counterparts (Mäkinen et al. 2010a). Similar results have been obtained from Sweden (Ali and Lindström 2006). The occupational differences in levels of leisure-time physical inactivity and activity are diminished after adjustment for body mass index. Another study found that childhood socio-economic conditions have both a direct and an indirect effect, via adulthood socio-economic conditions, on educational differences in leisure-time physical activity (Mäkinen et al. 2010b).

High *smoking* prevalence and low smoking cessation were associated with low SEP and high job strain. In Denmark one study used cross-sectional surveys at four different time points between the late 1980s and around 2005 to show that the social gradient in leisure-time physical activity remained stable but

increased with smoking. In Sweden smoking among the population aged 18-80 was associated with low education and income, unemployment, low neighbourhood SEP and low social capital. A Danish study showed that people with a higher educational level are more likely to quit smoking than those with a lower level (Zimmerman et al. 2006). One international comparative study (Denmark, Finland, Germany, Italy, Spain and Sweden) showed that smoking prevalence is highest in urban areas, and increases with urbanisation. Urban/rural inequalities are most pronounced among individuals with low educational levels. However, there are no significant differences in the annual rate of change in smoking prevalence between rural and urban areas (Idris et al. 2007).

Studies concerning *diet* or *eating habits* have been conducted in all the Nordic countries. A pattern clearly emerges indicating that people with a higher SEP have healthier eating habits. This pattern was seen for the entire age span, from infants to the elderly. Married people also appear to have healthier eating habits than their unmarried counterparts.

Studies on children, the elderly and immigrants

Children living with parents who have a low SEP have been found to have poorer health and less favourable health behaviour. Studies examining childhood social adversities in relation to adult health have revealed that people who were raised in families with a low SEP have more health-related problems such as CVD risk factors and obesity later in their adulthood. However, studies indicate that the adulthood socioeconomic position has a greater impact on health than the childhood position. Therefore studies examining childhood SEP in relation to later health should include adulthood SEP in their analyses.

A limited number of studies have been devoted to health inequalities among the *elderly* (over the age of 65). These studies mainly concentrate on SEP disparities and indicate that older adults with a higher position have a higher health status. Few studies have been carried out examining area or neighbourhood disparities among the elderly. Furthermore, health disparities in relation to marital status have attracted very little attention in the past five years. A few studies from Sweden have used longitudinal and cross-sectional studies together with clinical examinations and registry linkages to examine inequalities in *dementia* among the elderly. Evidence from Finland, Norway and Sweden (Sando et al. 2008; Rastas et al. 2010) likewise indicates that older adults with a lower educational level have a higher risk of developing dementia.

Health among *immigrants* has been studied in Denmark, Norway and Sweden, but not in Finland or Iceland. This is most likely due to the relatively low number of immigrants in Finland and Iceland. Studies concerning immigrants indicate clearly that those from developing countries, in particular, have poorer health status than the native citizens. A few studies from Norway have compared the health of the Sami people with the majority Norwegian population. The Sami individuals have been found to have poorer health than other Norwegians (Hansen et al. 2010). On the other hand, Sami men have a lower prevalence of obesity than the majority of Norwegian men. Among women this pattern is reversed (Nystad et al. 2010).

Disparities in obesity among men and women at the Nordic level appear to have some *gender* variation. Obesity varies by socio-economic position, especially among women, and is clearly less common among those with a higher position. Among men the SEP disparities of obesity are not equally clear. Some evidence suggests that obesity varies among women according to their adulthood SEP and among men by their childhood SEP. Occupational structures between men and women also play a role, as the incidence of some forms of occupationally-related cancer and occupational hazards varies between men and women.

Table 2. Main health outcomes studied in the Nordic countries since 2005 including summarised information on designs and results.

Health outcome	Designs	Groups with higher risk
Higher mortality	Cross-sectional and longitudinal registries, survey and registry linkages	low education, low occupational status, low income, low maternal education, unemployed, living alone, unmarried, disability pensioners
Poor self-rated health	Cross-sectional and longitudinal surveys and registry linkages	low education, low occupational status, low income, financial strain, low parental SEP, adverse work conditions, high job strain, immigrants, unmarried
Sickness absence	Cross-sectional registries, survey and registry linkages	adverse working conditions, high job strain, low job control, financial strain, manual workers, low education, low income
Poor mental health	Cross-sectional and longitudinal registries, cross-sectional and longitudinal surveys, survey and registry linkages	low education, low income, unemployed, job insecurity, high job strain, unmarried

Funding

The review of all existing annual reports, project catalogues and project databases available from governmental funding bodies in the Nordic countries did not provide sufficient information on funding. Therefore, the funding review needed to be complemented by a short survey questionnaire that was sent to the main funding bodies in the Nordic countries. The aim of this questionnaire was to gather more information concerning research projects (including thematic research programmes, etc.) in the area of health inequalities in the Nordic countries that have received funding since 2005. The questionnaire provided an overall picture of the funded projects. However, the data should be read with a critical eye: it is almost impossible to obtain completely analogous figures from different funding agencies due to factors such as different funding systems (programmes or project-orientated funding, etc.) and the variety of ways in which funded studies are classified.

Some of the funding bodies submitted exact figures, while other data are approximate. The total amount allocated annually to all research projects from 2005 to 2009 is shown in the funding table in Appendix IV. Currencies from Denmark, Iceland, Norway and Sweden have been converted into Euros (EUR) using the exchange rate valid on 29 September 2011.

The total amount of funding in all the Nordic countries for research projects examining health inequalities was approximately EUR 38.5 M during 2005-2009. The Danish Council for Strategic Research allocated over EUR 16 M for 13 projects for research on health inequalities. The largest overall funder in Denmark, the Danish Council for Independent Research funded three projects, totalling EUR 535 000. Between 2005 and 2009, the Swedish Council for Working Life and Social Research (FAS) allocated EUR 8.9 M for 51 projects and the Swedish Research Council allocated EUR 7.5 M for 22 projects that examined the distribution of health inequalities. The Academy of Finland funded seven projects totalling EUR 1.7 M. The two other funders from Finland, the Ministry of Education and Culture (Department for Cultural, Sport and Youth Policy, Sports Division) and the Ministry of Social Affairs and Health, funded seven projects amounting to a total of EUR 1.3 M. The Icelandic Research Fund sponsored seven projects totalling EUR 562 377. University of Iceland sponsored over 100 projects in the years 2005-2009 for research on health inequalities. However, the funding per project was limited, since the total sum was approximately EUR 916 000. In Norway the largest overall funder, the Research Council of Norway, did not fund any proposals classified as research on health inequalities in the years 2005-2009. The Joint Committee for Nordic Research Councils for the Humanities and the Social Sciences funded two projects for a total amount of EUR 633 600.

5. Conclusions

... health is wealth and wealth is health ...

5. Conclusions

What do we know?

The present review revealed that a large number of studies on distribution of health have been conducted in the Nordic countries since 2005. The overall message is "the lower the social status, the poorer the health" or "health is wealth and wealth is health". Despite improvements in terms of lower infant mortality rates and longer life expectancy for all population groups, the gap between disadvantaged groups and those who are better off has persisted or even widened in many respects. People with a lower educational level, income or occupational status tend to die at a younger age and to have a higher prevalence of most types of health problems. Health-related studies have traditionally concentrated on poor rather than on good health. The findings of the present review indicate that this remains the case also today.

It seems that most of the research on distribution of health conducted in the Nordic countries in the past five years has been related to issues that had been previously examined in depth. Hence most studies do not really generate major new insights. The majority of the studies have been associated with inequalities in mortality, self-rated health and health behaviours, in line with the existing tradition, and have only added a slightly new perspective to earlier studies. The well-known unequal distribution of health as measured by traditional SEP indicators is still evident. In particular, higher overall mortality and poorer health among those with lower socio-economic positions are still observed in all the Nordic countries. On the other hand, this review revealed that when mortality is studied in detail, the picture is not as straightforward as it might appear. Disparities in cancer mortality, in particular, vary by SEP depending on the type of cancer. Proximal factors such as health behaviours also have a significant impact on disparities in mortality.

Existing priorities and gaps

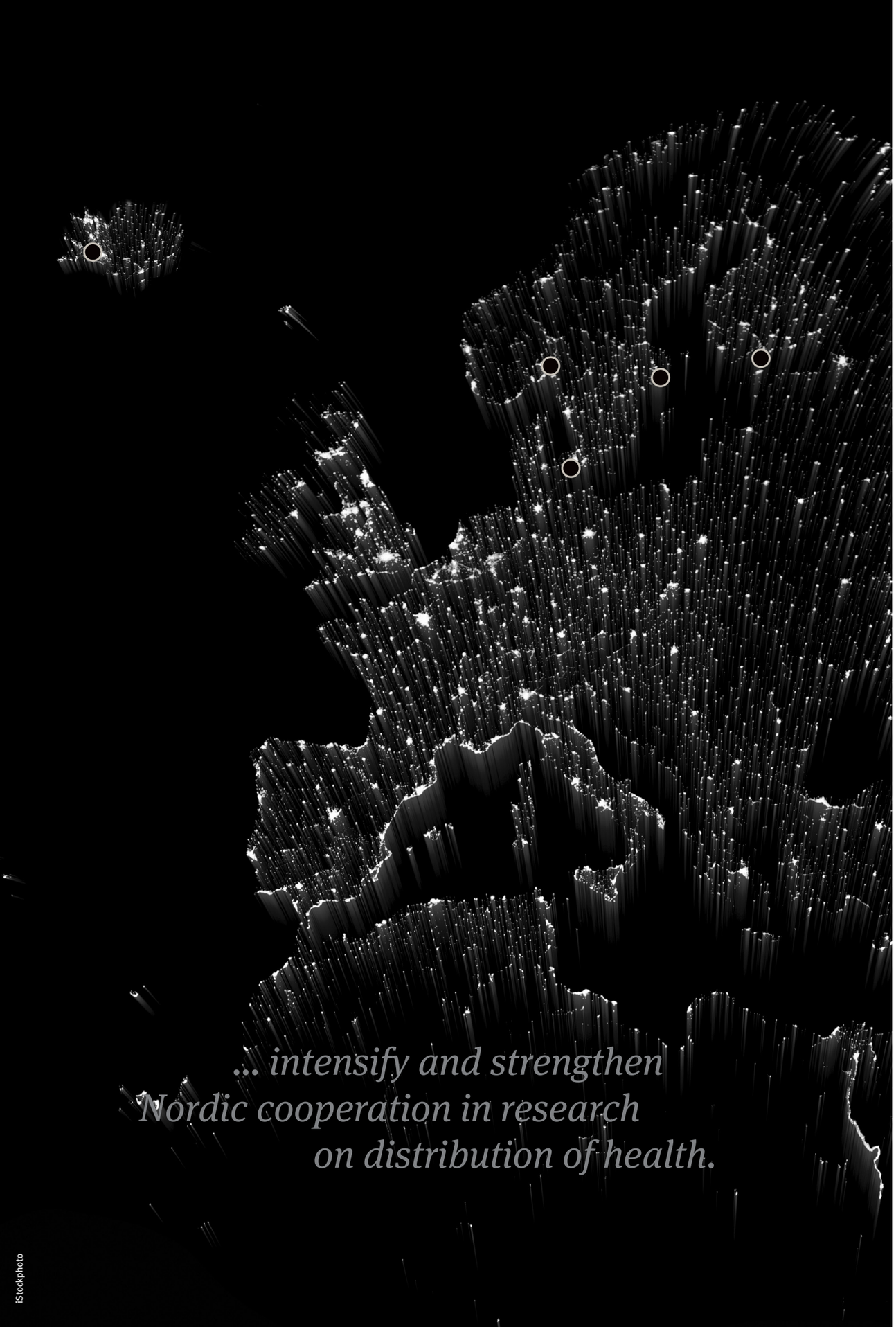
There are some major areas of research concerning distribution of health that have not attracted much attention either in the past five years or in the past few decades. Clearly there is a lack of intervention studies (experimental, quasi-experimental or natural (policy) interventions) concerning health inequalities. Furthermore, most of the interventions are intended more as a means of promoting change in various health outcomes than as a means of reducing inequalities in health. Therefore, we do not have sufficient information about causal relations or about how to tackle health inequalities.

Studies concerning geographical areas and neighbourhood health disparities are also still quite scarce. The same can be said for studies on health inequalities among the elderly, despite the fact that a rapid change in the age distribution of most Western societies is already underway.

In addition to the above-mentioned areas, one of the key health policy issues in the context of equality is the unequal distribution of health care services among population groups. Individuals with lower social status often face the greatest challenges in managing their health and in accessing health services, and thus tend to have the worst health outcomes. Despite the importance of this issue, research in this area has been weak in the Nordic countries. Although there is some information, mainly from Sweden, concerning how different population groups use the health services, there is a gap in our knowledge as to how service needs are met in the various groups. Registry-based data provide an opportunity to compare the specific use of public health services. However, this does not provide a complete and coherent picture. Health care is not simply a matter of using basic services. It also involves disease prevention, health promotion, rehabilitation and many other areas of care.

Many workers have occupational health care provided by their employer. Furthermore, an increasing number of people, especially those with a high income, are choosing to use private health care. Information from both public and private health care providers must be assessed in order to gain an overview of this issue. National population survey studies on a larger scale are required to provide a more comprehensive understanding of the accessibility and quality of the care received.

The fact that the Nordic countries share similar registries and databases would, if coordinated effectively, facilitate much broader research collaboration between countries than has previously been the case. More wide-ranging research collaboration would generate a more coherent picture of the potential health disparities between countries.



iStockphoto

6. Recommendations

Based on this mapping exercise and on discussions held during the meetings, the NORIA-net working group has arrived at the following conclusions and recommendations:

- There are obvious reasons why it would be an advantage to *intensify and strengthen Nordic cooperation* in research on distribution of health. First, this is a genuine Grand Challenge topic (that is, a major societal challenge requiring new scientific data to bring new insight for solutions). Second, although the Nordic countries are relatively homogeneous, interesting and perhaps increasing variations do exist, not least due to the impact of migration. The presence of similarities and differences is an asset when combining national data into much larger Nordic datasets. Third, the unique opportunity to use national registries, for instance, gives the Nordic countries an international edge, especially if their resources are combined.

- It is important to establish and *improve the research infrastructures* needed for sharing data. Good infrastructures are necessary not only for Nordic cooperation, but also for participating in large studies outside the Nordic region (e.g. in a European context). This is an issue all Nordic research funding agencies should take seriously by implementing efforts to ensure long-term infrastructure funding.

- The mapping exercise indicates that there is a *lack of data on prospective studies* on distribution of health. In particular, almost no experimental or natural intervention studies have been conducted, and this knowledge gap needs to be addressed.

- Our main suggestion is to *launch a Nordic thematic research programme* on distribution of health, financed in part by NordForsk, but with most of the funding provided by the national research funding agencies in the Nordic countries. A potential focus for the programme could be prospective research and interventions. Since adequate duration is required for prospective studies in the area of distribution of health and welfare to be meaningful, we propose a 10-year research programme. Only a programme of this duration can guarantee results that will have a significant scientific and societal impact.

- The programme should *be coordinated*, with regular, joint meetings between participant institutions and researchers as well as with decision-makers. The aim of these meetings (and any similar activities) is to enhance networking and the dissemination of results.

- Further, we propose that a *genuine common pot* without a fair return is used for this programme. This would ensure funding of the best qualified projects. This will ultimately benefit all the Nordic countries regardless of who receives the initial funding.

- We propose the *establishment of a Centre of Excellence* as a secondary alternative, to be used if the above suggestion of a long-duration thematic research programme is not realised. However, we do not believe that a Nordic Doctoral Programme on its own would lead to the scientific or societal aims presented above.

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Appendices

Appendix I: Search terms in PubMed and in Social Science Index

inequality[Title/Abstract]) OR
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housing[Title/Abstract]) OR
educational[Title/Abstract]) OR
environment[Title/Abstract]) OR
working conditions[Title/Abstract]) OR
occupational[Title/Abstract]) OR
poverty[Title/Abstract]) OR
migration[Title/Abstract]) OR
socioeconomic[Title/Abstract]) OR
neighborhood[Title/Abstract]) OR
sociodemographic[Title/Abstract]) OR
living arrangements[Title/Abstract]) OR
culture[Title/Abstract]) OR
social capital[Title/Abstract]) AND (health[All Fields] OR
ill health[All Fields] OR
disability[All Fields] OR
handicap[All Fields] OR
mortality[All Fields] OR
functional capacity[All Fields] OR
functional ability[All Fields] OR
obesity[All Fields] OR
BMI[All Fields] OR
health behaviour[All Fields] OR
lifestyle[All Fields] OR
health behaviour[All Fields] OR
health behaviours[All Fields] OR
health behaviors[All Fields] OR
lifestyles[All Fields] OR
disease[All Fields] OR
illness[All Fields] OR
sickness[All Fields] OR
morbidity[All Fields] AND (finland[All Fields] OR
sweden[All Fields] OR
norway[All Fields] OR
denmark[All Fields] OR
Iceland[All Fields]

Appendix II. NORIA-net Health and Welfare Survey Questionnaire

Dear Recipient,

The aim of the NordForsk-funded «NORIA-net on Health and Welfare» project is to find out how Nordic research funding organisations, including NordForsk, could support and strengthen the Nordic position in research on *socioeconomic health inequality* and effective public health interventions.

The first part of the project (year 2010) is to complete an overview on research, funding and funding systems. The focus is on different Nordic countries and on joint Nordic activities, but EU level (European Commission's Framework Programme, ESF, ERA-NETs, etc.) is also reviewed. This overview and subsequent recommendations on how to strengthen Nordic research in health inequalities will be distributed to Nordic political decision makers, to main Nordic governmental research funding agencies and to Nordforsk (year 2011).

With the attached short questionnaire we aim to gather all possible information concerning funded research projects (programmes, etc.) since 2005 in the area of health inequalities in the Nordic countries.

It is essential for the NORIA-net project to receive up-to-date information on funded research projects. We kindly ask you to fill in this short survey questionnaire and return it by e-mail to Maria Nilsson by *1st of February 2011* at the latest.

Yours sincerely,

Mikael Fogelholm
Chair of the NORIA-net
Health and Welfare steering group

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Academy of Finland
e-mail: mikael.fogelholm@aka.fi

Maria Nilsson
Secretary of the NORIA-net
Health and Welfare steering group

Senior adviser
NordForsk
e-mail: maria.nilsson@nordforsk.org

NORIA-net health and welfare
Survey questionnaire to the main funding bodies

1. Name of the institution (including department, council etc.)

2. Total amount (euro, SEK, NOK, DKK, ISK) given annually to all research projects during years 2005-2009.

3. Total number of research projects examining distribution of health inequalities during years 2005-2009.

4. The total funding (euro, SEK, NOK, DKK, ISK) given to the above research projects

5. Any research initiatives (started or ongoing during years 2005-2009) on health inequalities (research programs, projects, centres of excellence etc.)? Name, short description of aims, resources, and if applicable also the number of funded projects.

Please send the questionnaire to *maria.nilsson@nordforsk.org*
by 1. February 2011 at the latest.

Appendix III: Example of main databases from Denmark, Finland and Iceland

Data on Sweden: «Översyn av de nationella kvalitetsregistren. Guldgruvan i hälso- och sjukvården Förslag till gemensam satsning 2011-2015» (Report available in Swedish only)
http://www.regeringen.se/sb/d/13355/a/149077)

Danish data sources for the study of health inequalities

Name of data	Survey period and representativeness	Design	Sample size	Organisation
The Disease Prevention Register	1977-1994	The purpose of the registry is to facilitate the comparison of several social indicators and health outcomes.	All citizens in Denmark	Statistics Denmark.
The National Health Service Register	Introduced in 1973	The National Health Service Register contains information on all services in general medical practice and specialist practice, and on dentists, physiotherapists, chiropractors, chiropodists, psychologists and other professionals who are supported by the National Health Insurance Scheme.	All citizens of Denmark who have been in contact with a practitioner, specialist, dentist, physiotherapist, chiropractor, chiropodist, psychologist or other professionals who are supported by the National Health Insurance Scheme.	The National Board of Health.
Diagnosis Related Grouping (DRG)	Mid-1990s	The DRG system provides information on the costs associated with patient treatments. The DRG belongs to the Danish Casemix system used to classify the description of the wide variety of diseases that characterise the patients in the health care system.	All persons who have been in contact with the Danish public somatic hospitals or certain private hospitals and private clinics are included.	The Ministry of Interior and Health.
The National Hospital Register (LPR)	1977	The National Hospital Register (LPR) provides administrative and medical information on all contact with Danish hospitals, both public and private.	The registry includes information on all persons who have been discharged after stationary treatment (meaning that the patient was in hospital after the treatment) in a somatic ward at a Danish hospital since 1977.	The National Board of Health. The head of the Faculty of Medical Science at the University of Southern Denmark.
The Danish Twin Registry (DTR)	It was founded in 1953 and initially included birth cohorts from 1870-1910.	The Danish Twin Register (DTR) is a public, self-financing research registry that aims to carry out health research highlighting the influence of heritage and environment on the development of disease.	The register includes twins born from 1870 until 2000 in Denmark.	The Centre for Basic Psychiatric Research. The University Hospital of Aarhus. Center for Psykiatrisk Forskning. Århus Universitetshospital.
The Danish Psychiatric Central Register	It was originally founded in 1939 as a manual registry, and was established as an electronic registry in 1969. In 1995, it became a part of the National Hospital Register.	The Danish Psychiatric Central Register contains information on all contact with the secondary psychiatric treatment system. Such information includes, among other things, diagnosis, treatment, hospital and admission terms.	The registry includes all persons in Denmark, the Faeroe Islands and Greenland who have been hospitalised in a psychiatric ward since 1969.	The National Board of Health
The Danish Abortion Register	From 1 October 1973	In the Danish Abortion Register legally induced abortions are recorded with details of legislation and information about the pregnancy. Trends in the number of legally induced abortions, e.g. distributed among different age groups or place of residence, can be followed in the registry.	The registry contains information on women who have had a legally induced abortion at a public or private hospital / clinic in Denmark.	The National Board of Health

Danish data sources for the study of health inequalities *(continued)*

Name of data	Survey period and representativeness	Design	Sample size	Organisation
The Danish Medical Birth Register (MFR)	From 1973	The Danish Medical Birth Register (MFR) contains information on all births in Danish hospitals and home births. The registry is used to describe births in Denmark as one of the key national health indicators.	The registry contains information as from 1973 on children born to women who at the time of delivery were listed in the CPR and who had given birth in Denmark.	The National Board of Health
The National Civil Registration System (CPR)	The registry was established on 1 April. 1968	The National Civil Registration System (CPR) is a nationwide registry that contains basic personal information on anyone who has a personal identification number (CPR number). The CPR number is a unique identification number that consists of a person's birth date and year and 4 digits, e.g. 061085-2010. Females are always assigned an even number as the last digit, while males are assigned an odd number.	All persons who are enrolled in a Danish national population registry, as well as persons who are assigned a Danish CPR number without having been enrolled in a registry, such as sailors or persons liable to pay tax deducted at source (A-taxpayer). The registry includes Greenland, but not the Faeroe Islands.	Ministry of Interior and Health
DANCOS (The Danish National Cohort Study)	The SUSY surveys were conducted in 1987, 1994, 2000 and 2005.	DANCOS is a registry based on a combination of the Health and Morbidity studies (SUSY) and several nationwide registries. SUSY is a series of cross-sectional and longitudinal studies of the Danish population, which makes it possible to provide time series and follow the development in the incidence and distribution of health and morbidity.	The study population is representatively selected from among all Danish citizens who are 16 years or older and living in Denmark.	The National Institute of Public Health.
The Integrated Database for Labour Market Research (IDA)	From 1980	The Integrated Database for Labour Market Research (IDA) is based on several statistical registries at Statistics Denmark. The database contains information about personal characteristics of the population, the population's connection to the labour market and information about workplaces and companies. The unique aspect of the database is that people and workplaces are linked. Therefore, persons can be characterised on the basis of information about the workplace in which they are employed, and conversely workplaces can be described on the basis of information about their employees. Moreover, it is possible to follow both individuals and workplaces over time.	The database contains information on all persons in the population and all workplaces with employees.	Statistics Denmark.
The Coherent Social Statistics	2008	The Coherent Social Statistics is based on several statistical registries at Statistics Denmark. The statistics indicate the proportion of the population who receive income compensation benefits within a calendar year. The statistics include the specific income compensation benefits, measured at the beginning and end month of reception of the specific type of benefit, length of days of reception of a given income compensation benefit, and annual payments. Moreover, the statistics facilitate the definition of the recipient population on the basis of a number of types of social background information, such as family and household type, education, occupation, income, nationality (immigrant/descendants), etc.	The statistics illustrate the proportion of the population who receive income compensation benefits within a calendar year.	Statistics Denmark

Danish data sources for the study of health inequalities *(continued)*

Name of data	Survey period and representativeness	Design	Sample size	Organisation
The Danish Heart Registry	2008	The Danish Heart Registry was established as part of the implementation of the Heart Plan to monitor the activity and quality of relevant procedures. The registry gathers medical and administrative data on patients referred for invasive cardiac investigation and treatment, and patients referred for cardiac surgery in the hospital wards connected to the registry. Dates of referral, hospitalisation, operations and discharge are reported for every patient's course of treatment. Further information on the course of the procedure, including any complications, is also reported. Finally, demographic data and other information (e.g. age, sex, weight, smoking status) which can be used to adjust for possible differences in the composition of the patient population are reported.	The registry includes all persons who have been hospitalised for or who have died of a cardiovascular disease since 1978.	The Institute of Public Health

Finnish data sources for the study of health inequalities

Name of data	Survey period and representativeness	Design	Sample size	Age range	Organisation
Health 2000 Health Examination Survey	2000-2001 National	Cross-sectional interviews and health examinations	8 028	30-99 years	National Institute of Health and Welfare
Mini-Finland survey	1978-1980 National	Cross-sectional interviews and health examinations	8 000	30-99 years	National Institute of Health and Welfare
FINRISK study	1972-2007, conducted once every five years covering different regions of Finland	Cross-sectional follow-up Survey questionnaire and health examinations (limited sample)	12 000 (in 2007)	25-74 years	National Institute of Health and Welfare
Conscription examinations and health checks on arrival	Every year National	Conscripts' fitness for military service and other health-related factors in connection with conscription examinations and health checks on arrival	All young men in Finland	17-18-year-old men	The Finnish Defence Forces
Health and the Use of Health Services in Finland (TERVA)	1964, 1968, 1976, 7987, 1995-96 National	Cross-sectional follow-up Interview questionnaire	13 000 (in 1995-1996) All household members	All ages	National Institute of Health and Welfare
Adolescent Health and Lifestyle Survey	1977- every other year National	Cross-sectional follow-up survey questionnaire	10 000	12-18 years	University of Tampere
School Health Promotion Study	1996- every year National	Cross-sectional follow-up survey questionnaire	103 445 (in 2010)	14-18 years (school pupils)	National Institute of Health and Welfare

Finnish data sources for the study of health inequalities *(continued)*

Name of data	Survey period and representativeness	Design	Sample size	Age range	Organisation
Health Behaviour in School-aged Children (WHO/HBSC)	1984-2002 every fourth year Part of WHO survey	Cross-sectional follow-up survey questionnaire	5 500 (in 2002)	11, 13 and 15- year-old schoolchildren	University of Jyväskylä
Health Behaviour and Health among the Finnish Adult Population (AVTK)	1978- every year National	Cross-sectional follow-up survey questionnaire	5 000	15-64 years	National Institute of Health and Welfare
Health Behaviour and Health among the Finnish Elderly (EVTK)	1985- every other year National	Cross-sectional follow-up survey questionnaire	2 400 (in 2009)	65-84 years	National Institute of Health and Welfare
Work and Health Study	1997- conducted at three-year intervals National	Cross-sectional Telephone interview	3 000	25-64 years	The Finnish Institute of Occupational Health
Welfare and Services in Finland Survey (HYPA)	2004, 2006, 2009 National	Cross-sectional Combining telephone and face-to-face interviews, postal questionnaires and registry data	5 800 (in 2009)	18-79 years separate samples for people aged 80 or over	National Institute of Health and Welfare
Statistics Finland Living Conditions Survey (ELO)	1978, 1986, 1994 National	Cross-sectional Interview survey	Ranging from 8 600 to 12 000	15 years or over	Statistics Finland
Drinking Habits Survey	1992, 2000, 2008 National	Cross-sectional Face-to face interview	4 000	15-69 years	National Institute of Health and Welfare
Findiet Survey	1992- every fifth year covering different regions of Finland (part of FINRISK study)	Cross sectional Face-to face interview	2039 (in 2007)	25-64 years	National Institute of Health and Welfare
EKSY datasets	1970- every fifth year National	Combination of different registries (population censuses, mortality, etc.)	Entire population	All ages	Statistics Finland
HILMO register	1994- annually National	Combination of health care registries	Entire population	All ages	National Institute of Health and Welfare

Icelandic data sources for the study of health inequalities

Name of data	Survey period and representativeness	Design	Sample size	Age range	Organisation
The Icelandic Accident Register	Database with data from 2002 and onwards. Number of registering parties has been increasing year by year. It is estimated that around 60-70% of all accidents in Iceland are registered.	Centralised database	Not a sample but the entire population or all injured who seek the services of those that register data in the IAR. At the moment the registering parties are: Landspitali hospital, Akureyri hospital, Akranes hospital, 90% of all health care centres, the Administration of Occupational Safety and Health, Tryggingamidstodin Ltd., the National Commissioner of the Icelandic Police.	All ages	The Directorate of Health manages the database.
The Patient Hospital Discharge Register	Database in place since 1999. Includes all data regarding inpatients in hospitals in Iceland. Some data on ambulatory care but data on representativeness not available.	Database	All those who are admitted to hospitals in Iceland.	All ages	The Directorate of Health manages the database.
Register of Primary Health Care Contacts	Database with data from 2004. Includes data regarding outpatients in Health Care Centres.	Database	All those who use Health Care Centres in Iceland.	All ages	The Directorate of Health manages the database.
Register of induced abortions	Database with data from 1984 and onwards.	Database	All women who undergo induced abortions in Iceland.	All ages	The Directorate of Health manages the database.
Register of sterilisations	Database with data from 1984 and onwards.	Database	All those who undergo sterilisations in Iceland.	All ages	The Directorate of Health manages the database.
Icelandic Birth registrations	Database with data from 1981 and onwards.	Database	All births in Iceland.	0 years	The Directorate of Health is responsible for the registration according to law, but the National University Hospital of Iceland manages the database.
Health Behaviour in School-aged Children (WHO/HBSC)	2005/6-2009/10 every fourth year Part of WHO survey	Target population, follow-up survey questionnaire	11 800 (in 2005/6)	11, 13 and 15-year-old schoolchildren	Faculty of Social Science and Law University of Akureyri
European School Survey Project on Alcohol and Other Drugs (ESPAD)	1995-2011 Every fourth year	Target population follow-up survey questionnaire	3 543 (2003)	Students who will be 16 years old in the data collection year	Faculty of Social Science and Law University of Akureyri

Icelandic data sources for the study of health inequalities *(continued)*

Name of data	Survey period and representativeness	Design	Sample size	Age range	Organisation
Health and well-being of Icelanders	2007 and follow-up 2009 National	Cross-sectional random sample	9 807	18-79 years	Directorate of Health
Smoking in Movies	2010 and follow-up 2011 European research project (6 countries take part)	Convenience sample Survey questionnaire	2 600 (in 2009)	12-15 years	Directorate of Health
Hälsa och välfärd bland barn och ungdom i de nordiska länderna	2011	Cross-sectional stratified random sample Survey uestionnaire	3 600	2-17 years (their parents answer)	Directorate of Health

Appendix IV: Funding tables

Denmark

Name of the institution	Total amount given annually to all research projects, 2005-2009	Total number of research projects examining distribution of health inequalities, 2005-2009	The total funding given to the research projects examining health inequalities	Any research initiatives (started or ongoing during years 2005-2009) on health inequalities
Danmarks Grundforskningsfond/ Danish National Research Foundation	2005: EUR 26 233 000 2006: EUR 26 233 000 2007: EUR 32 630 000 2008: EUR 43 180 000 2009: EUR 36 957 000 Total: EUR 165 233 000	One to two Centers of Excellence within life and medical sciences use test subjects with different socioeconomic backgrounds (e.g. demographic, activity levels).	None	None
The Danish Council for Independent Research	2005: EUR 112 400 000 2006: EUR 121 733 333 2007: EUR 136 666 667 2008: EUR 149 200 000 2009: EUR 164 000 000 Total: EUR 684 000 000	Three projects.	EUR 534 820	Three
The Danish Council for Strategic Research	2005: EUR 30 130 000 2006: EUR 55 420 000 2007: EUR 94 170 000 2008: EUR 98 340 000 2009: EUR 155 910 000 Total: EUR 433 970 000	13 projects	EUR 16 163 240	One

Finland

Name of the institution	Total amount given annually to all research projects, 2005-2009	Total number of research projects examining distribution of health inequalities, 2005-2009	The total funding given to the research projects examining health inequalities	Any research initiatives (started or ongoing during years 2005-2009) on health inequalities
Academy of Finland (tot.) Council for Health (CH) and Research Council for Culture and Society (CS)	2005: EUR 220 M (tot.) / EUR 35 M (CH) / EUR 50 M (CS) 2006: EUR 240 M (tot.) / EUR 40 M (CH) / EUR 65 M (CS) 2007: EUR 260 M (tot.) / EUR 45 M (CH) / EUR 65 M (CS) 2008: EUR 290 M (tot.) / EUR 55 M (CH) / EUR 68 M (CS) 2009: EUR 305 M (tot.) / EUR 56 M (CH) / EUR 70 M (CS) Total: EUR 1 315 M (tot.) / EUR 231 M (CH) / EUR 318 M (CS)	Seven (six by CH and one by CS)	EUR 1.7 M (out of which EUR 0.25 M by CS)	None
Ministry of Education and Culture, The Department for Cultural, Sport and Youth Policy – Sports Division	2005: EUR 1 929 000 2006: EUR 1 977 500 2007: EUR 2 000 000 2008: EUR 2 232 311 2009: EUR 2 456 134 Total: EUR 10 594 954	Two	EUR 140 000 + EUR 402 300 (includes also years 2010 & 2011) Total: EUR 542 300	None
Ministry of Social Affairs and Health	Per year: EUR 400 000-500 000 Total: EUR 2 000 000-2 500 000	Five	EUR 807 000	None

Iceland

Name of the institution	Total amount given annually to all research projects, 2005-2009	Total number of research projects examining distribution of health inequalities, 2005-2009	The total funding given to the research projects examining health inequalities	Any research initiatives (started or ongoing during years 2005-2009) on health inequalities
Rannis The Icelandic Research Fund	2005: EUR 3 030 590 2006: EUR 2 449 466 2007: EUR 3 624 210 2008: EUR 4 067 863 Total: EUR 13 172 129	Seven	EUR 562 377	One
Háskóli Íslands (University of Iceland): University of Iceland Research Fund, University of Iceland Research Fund for Doctoral Studies, Eimskip Fund of The University of Iceland (doctoral studies)	2005: EUR 750 150 2006: EUR 1 683 195 2007: EUR 2 846 910 2008: EUR 2 632 863 2009: EUR 2 716 145 Total: EUR 10 629 263	2005: 18 2006: 19 2007: 17 2008: 18 2009: 31	2005: EUR 56 550 2006: EUR 142 781 2007: EUR 188 396 2008: EUR 176 524 2009: EUR 352 110 Total: EUR 916 361	Five

Norway

Name of the institution	Total amount given annually to all research projects, 2005-2009	Total number of research projects examining distribution of health inequalities, 2005-2009	The total funding given to the research projects examining health inequalities	Any research initiatives (started or ongoing during years 2005-2009) on health inequalities
Joint Committee for Nordic Research Councils for the Humanities and the Social Sciences. The Research Council of Norway.	2006: EUR 830 000 2007: EUR 430 000 2008: EUR 250 000 2009: EUR 1 170 000 Total: EUR 2 680 000	Two	EUR 633 600	Two
The Research Council of Norway, Social Sciences	2005: EUR 38 262 810 2009: EUR 48 466 225 Total: EUR 86 729 035 Increase during the period mainly due to new obligations; only a slight growth in volume.	None	None	None

Sweden

Name of the institution	Total amount given annually to all research projects, 2005-2009	Total number of research projects examining distribution of health inequalities, 2005-2009	The total funding given to the research projects examining health inequalities	Any research initiatives (started or ongoing during years 2005-2009) on health inequalities
Swedish Council for Working Life and Social Research (FAS)	Per year: EUR 166 M Total: EUR 830 M	51 projects	EUR 8 900 000	Two
Riksbankens Jubileumsfond	Approx. Per year: EUR 9 979 125 Total: EUR 49 895 625	One	EUR 223 244	None
Vinnova	2005: EUR 217 M 2006: EUR 217 M 2007: EUR 217 M 2008: EUR 217 M 2009: EUR 217 M Total: EUR 1 085 M	None	None	None
The Swedish Research Council, Department of Research Funding (Vetenskapsrådet, Avdelningen för forskningsfinansiering)	2005: EUR 281 M 2006: EUR 303 M 2007: EUR 330 M 2008: EUR 392 M 2009: EUR 451 M Total: EUR 1 757 M	22	EUR 7 479 552	None