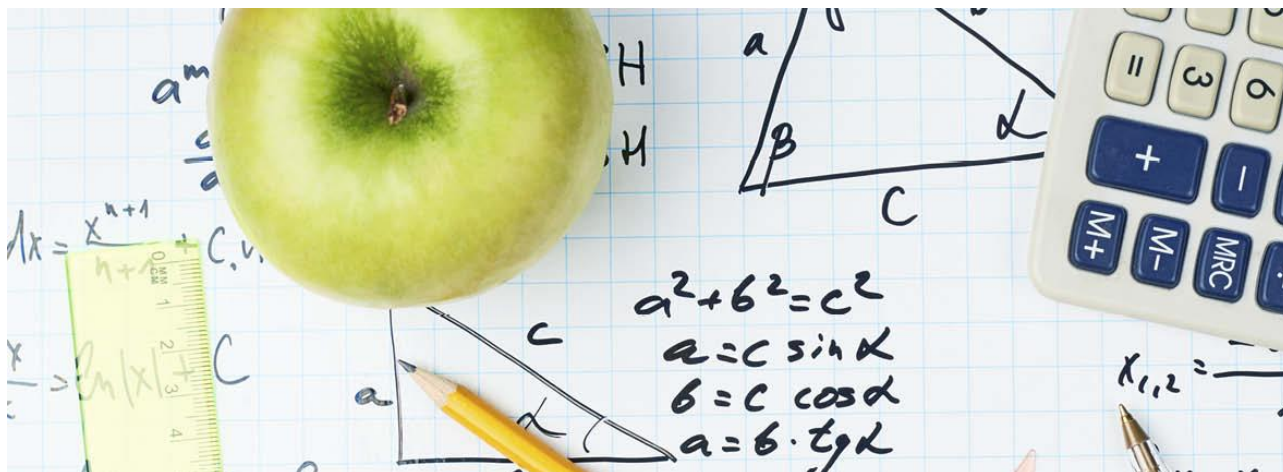


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**Healthcare, health and inequality in health in the Nordic countries**

Version 2 - 25.1.2018

By

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Healthcare, health and inequality in health in the Nordic countries

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Abstract

All five Nordic countries emphasize equal and easy access to healthcare, assuming that increased access to healthcare leads to increased health. It is the purpose of the present study to explore to which extent the populations of these countries have reached good health and a high degree of socio-economic equality in health.

Each of the five countries has established extensive public health programmes, although with somewhat different emphasis on the causes of ill-health, that is, whether it is mainly attributed to individual behaviour or social circumstances. However, attitudes have changed over time.

We compare these countries to the UK and Germany by using data from the European Social Survey for 2002 and 2012 in addition to OECD statistics for the same years.

Health is measured by self-assessed health in five categories, which is transformed to a cardinal scale using Swedish time trade-off (TTO) weights. As socio-economic measures we use household income and length of education.

Socio-economic inequality in health is elicited in two ways. First, we show social gradients by comparing the percentage of respondents in the lower income group reporting good or very good health to the corresponding rates in the upper income group. Second, we show concentration indices of socio-economic related inequality in health. Everything else kept equal, good health and the size of the concentration index are negatively associated by definition.

In 2012, mean health, based on Swedish weights applied to all countries, is above 0.93 in all the Nordic countries and the UK, but lower in Germany.

Rates in good or very good health in the lower income half of the samples are above 0.6 in most Nordic countries and even higher in Iceland and Sweden, but below 0.5 in Germany. There is a clear gradient in all countries as the rates in good or very good health is higher in the upper income group compared to the lower income group. However, when displayed in a graph the concentration curves nearly follow the diagonal, implying almost no income or education related inequality in self-assessed health weighted by TTO-based preferences. The apparent difference in results is a natural consequence of

using different methods which, in essence, respond to different questions. A similar pattern appears when length of education is used instead of income.

We compare four key life-style related determinants of ill health and find that while there are differences in relative levels among the countries, Germany has a relatively high level in three of these determinants, followed by the UK and Denmark. We find no association between the level of resources used and health status.

Each of the Nordic countries have introduced centrally initiated comprehensive public health programmes to increase health and reduce socio-economic inequalities in health. In general, the Nordic countries have achieved good health for their populations as well as a high degree of socioeconomic equality in health. Improvements in life-style related determinants of health are possible, however.

Key words: International comparison of health systems; health status; inequality in in health.

JEL classification codes: I11; I14; I19.

Mathias Kifmann, Carl Hampus Lyttkens, Thorhildur Ólafsdóttir and Hannu Valtonen contributed with information on public health policies in each of their countries and with editing of the paper.

1. Introduction

There are five Nordic countries, Denmark, Finland, Iceland, Norway and Sweden, all of which adhere to the concept of a welfare state with healthcare as an important element and with equal and easy access to health care as an important goal (Lyttkens *et al.*, 2016). These countries are characterized by predominantly tax financed healthcare and universal coverage. If socio-economic inequality in health care and health exists, it calls for political as well as research attention, either directly focusing on population segments with a low socio-economic status and low health, or indirectly through improved health in general, as these policies are interconnected. Among others, the OECD has reported inequality in health for member countries (OECD, 2015) as well as differences in self-reported health status by income (OECD, 2016, p. 72-73).

It is the aim of the present paper to investigate to which extent health systems in the Nordic countries have achieved good health for their populations as well as low socio-economic inequality in health. The chosen indicators are compared to the corresponding indicators for two other countries, Germany and the UK. The reason for choosing these two countries is that they are neighbouring countries, are located in Western Europe and still have quite different health care systems. The German healthcare system is based on Chancellor Bismarck's model of healthcare system which was implemented in the late 19th century. The system consists of a statutory health insurance composed of self-regulated bodies with mandatory participation (member-based sickness funds) and private health insurance. Almost 90 percent of the population is covered by statutory health insurance. Members have free choice of sickness fund. Civil servants are insured by special government schemes and private health insurance. Furthermore, private health insurance provides coverage for most self-employed and employees who have opted out of the sickness fund system (Busse and Blümel, 2014).

The UK National Health Service (NHS) was created after the Second World War in accordance with Lord Beveridge's report (Beveridge, 1942). It is characterized by tax-financed universal coverage for all citizens or residents. Entitlement depends on citizenship or residence in the country (Cylus *et al.*, 2015).

The Nordic healthcare systems share the main characteristics of Lord Beveridge's National Health Service model, such as tax financing, public provision through public hospitals and general

practitioners. GPs are self-employed and contract with the health service in Denmark and Norway while most GPs in Finland and Iceland are salaried and the payment varies in Sweden, but most GPs in Sweden are salaried (Olsen *et al.*, 2016). In addition, there exist some private hospitals in the Nordic countries.

“Socioeconomic” usually refers to social and economic status. Due to difficulties in creating comparable groups defined by social status across countries, socioeconomic status is usually measured by income as a proxy variable in international comparisons. Length of education would be another indicator on a cardinal scale which can easily be documented.

We describe health policies and programmes extensively. Rather than to test hypotheses about which programmes works under which conditions, it is the purpose to document the extent and character of public health policies and programmes in the Nordic countries compared to the two countries outside the Nordic countries.

Health is usually distributed inequitably across the population, and so are income and education. Income-related inequality in health measures the joint distribution of income and health when individuals are ranked by income. Similarly, education related inequality measures the joint distribution of health and education when individuals are ranked by length of education. We analyse both income and education related inequality based on individual level survey data.

Health and its distribution have numerous determinants which cannot be disentangled in the present paper, in particular due to data limitations at an individual level. Following this introduction, we describe public health policies and programmes on the basis of especially government reports and white papers from each country. Next, we use survey data from the European Social Survey (ESS) together with aggregate OECD data to describe socioeconomic inequality in health, non-medical determinants of health, health behaviour and resources allocated to healthcare. Finally, we discuss how these factors may have influenced the general health status as measured by self-assessed health, and its socio-economic distribution.

2. Public health policies and programmes in the Nordic countries

The term “public health” is used in accordance with WHO’s definition as “the art and science of preventing disease, prolonging life and promoting health through the organized efforts of society” (WHO, 2017).

As a collaboration between the Nordic countries the Nordic School of Public Health was established in 1953, and through educational programmes and research it became an inspiration for the development of public health. It was closed in 2014, as each Nordic country had established its own educational and training programmes in public health (Foldspang, 2016).

Public health policies in the Nordic countries have much in common. All five countries have established public health institutes to monitor and analyze the health of the populations and have also set up public health education programmes. Furthermore, each country has adopted national public health programmes, including comprehensive vaccination programmes for children, and public health activities are initiated and run by the public sector on its own or in collaboration with NGOs. However, as demonstrated by Vallgård (2011), there are differences among the countries with respect to how they see the causes of ill health and, consequently, their approaches to public health policies. Vallgård makes a distinction between policies that focus on individual behaviour and responsibility and policies that focus on social conditions and other factors which are external to the individual. The first approach is considered as being in accordance with a liberal political ideology emphasizing the individuals’ autonomous choices, which can be accomplished through necessary information. The second approach is considered as being true to a social democratic ideology with an emphasis on state intervention to improve health as well as social and living conditions. A policy in between these extremes is considered as a social liberal policy which emphasizes equal opportunities on the basis of a state intervention to facilitate self-determination (Vallgård, 2007). She concludes that all aspects are present in each of the four largest Nordic countries, but that there is a difference with respect to the extent to which social factors are emphasized and therefore to which extent politicians are seen as being responsible for the health of the population. In brief, in the 2000s the public health policy in Denmark is categorized as being the most liberal one, while Norway had the most social democratic or social liberal policy. Sweden and Finland are seen as in between. However, differences in national traditions are considered at least as important as differences between political ideologies in formulating the health

policies in light of the observation that change of colour of the government does not necessarily change the content of the policies (Vallgård, 2011).

Social inequality in health and life expectancy has been documented extensively in each country by academic researchers and authorities, among others Lahelma *et al.* (2001), Asgeirsdottir *et al.*, (2013), OECD (2017), Dahl *et al.* (2014), Diderichsen *et al.* (2011), Malmökommissionen (2013), Asgeirsdottir and Ragnarsdóttir (2014), Palosuo *et al.* (2007). The political approach to reducing inequality in health differs among the countries and is associated with different approaches to reduce health risk and improve health and life expectancy (Diderichsen *et al.* 2015). Compared to Denmark, Norway and Sweden to a greater extent emphasize the living conditions (poverty, being expelled from the labour market, poor education and poor housing) as causes of social inequalities in health (Norwegian Government, 2003).

With respect to local health policies, Diderichsen *et al.* (2015) observe that Denmark focuses narrowly on lifestyle, Norway on the gradient in morbidity and its determination and Sweden on local activities with a weaker association with central policy.

With respect to tackling inequality in health a distinction can be made between universal policies targeting the whole population and residual policies focussing on groups with specific characteristics (Vallgård, 2010). A universal approach accords with an interpretation of the problem as a social gradient, while the residual approach corresponds with an interpretation of the problem of exclusion or disadvantage, which comprises a minor share of the population. Vallgård identifies the Danish policies in the 2000s as being residual while she argues that Sweden changed from a universal to a residual policy due to a change of government. The Finnish and Norwegian policies are seen to rely on a combined strategy.

The following sub-sections describe the characteristics of each country's public health programmes in more detail. Consistent with the selection of survey years, we describe public health policies during the first decade of this century, although it might be claimed that the health of a population is a result of long-term policies in the past. However, in accordance with the theme of this journal issue, we also describe what has been accomplished in terms of health policy as well as the approaches used in different countries.

The description documents that all of the Nordic countries have had extensive public healthcare programmes during the last two decades. Each country has a policy to increase health and decrease health inequality which is documented in, among others, Diderichsen *et al.* (2015). Public health programmes vary with respect to the nature of the programmes. Hence, while some programmes are universal and are targeting the whole population, numerous specific programmes are targeting various phases over the life span of the population from birth to death. Depending on the nature of the programmes and the actual policy, the responsibility for implementing the programmes changes between government, local government, employers or the individual. Some programmes address risk factors or marginalized groups, whereas general policies, focus on improving the health of the population or on reducing inequality in health. Implicitly, policies to improve health with a focus on risk factors are assumed to reduce inequalities in health. Policies have varied over time in each country – at least on paper, but there may have been some inertia in implementing them. Prevention and health promotion prevail in many aspects of an individual’s life from birth to death.

The health of a population, however, does not only depend on public health programmes. Obviously, the structure of the curing health sector as well as many other sectors in society plays a role in influencing health, such as education or environment.

Generally speaking, there is some variation in the public health packages from country to country, but they all have some common elements (Vallgård, 2011; Diderichsen *et al.*, 2015).

It is not possible a priori to hypothesize how these packages have worked, in particular how they have affected the populations’ knowledge of risk factors, health behavior and health. The reasons are as follows: First, health of individuals may be the result of health behaviour and exposure over the life time. Second, the evidence of the effects of various programmes vary. Third, one has to consider how these programmes work together and finally the influence from other sectors in society plays a role as well.

Denmark

During the 2000s the public health service in Denmark was based on a 10-year programme that was launched by a social democratic–social liberal government in 1999 (Danish Government, 1999). The programme was the second public health programme, and it was introduced in response to a relatively low life expectancy in Denmark. The relatively low life expectancy in Denmark is considered to be due to historically late initiatives to prevent smoking and excessive consumption of alcohol (Diderichsen *et al.*, 2011). With inspiration from WHO’s strategy for the 21st century, the programme listed 17 targets covering specific risk factors. The main elements in the programme were continued in the “Healthy throughout life 2002-2010” programme (Danish Government, 2002) which was launched by a newly elected liberal-conservative government, but with an added a focus on preventing a number of diseases and disorders that are common in the population. For each of the eight risk factors it outlined suggestions as to what could be done by the individual itself, the close community and society at large. Individuals should be provided with necessary knowledge and tools to live a healthy life. The programme also listed a number of services and measures targeting the quality of life of the population. To continuously monitor trends in life expectancy, health, health behaviour and public services, a list of indicators was developed.

Following a structural reform of the Danish public sector in 2007, the responsibility for primary disease prevention and health promotion was transferred from the former counties to municipalities, and since then it has been strengthened. To increase local preventive efforts by the municipalities, they were given an economic incentive in the shape of co-payment for regional health services for each patient contact or admission. The co-payment was based on a list of fees, covering all types of contact irrespective of whether the municipalities were able to prevent a contact or not. It is worth noticing that municipalities have no direct influence on the population’s access to healthcare through general practitioners or referrals to hospitals. The average share of co-payment amounts to about 18% of the total regional health care budget.

In 2009 a Government Commission on Prevention released its report containing 52 concrete suggestions for a strengthened national preventive effort with the aim to improve life expectancy (Forebyggelseskommissionen, 2009). Among the tools suggested for reducing the most important risk factors (unhealthy nutrition, tobacco, alcohol and lack of exercise) were public campaigns and

regulation through taxes and subsidies, prohibition and infrastructure. Individuals with limited resources would be supported to make healthy choices. A distinction was made between patient-focused prevention, which was considered to be the responsibility of the regions, and citizen-focused prevention, which was considered to be a municipal responsibility.

The “Health package 2009” (Danish Government, 2009) was a follow-up to the recommendations of the Commission on Prevention. One policy was to strengthen the municipalities’ incentive to increase prevention for their citizens, and the package listed 30 disease-preventing initiatives through a national action plan for prevention. The plan included a goal of increasing life expectancy by three years over the next 10 years. The government’s policy was based on six principles: personal responsibility supported by good public information, clear economic incentives to make a healthy choice through increased taxes on unhealthy consumption, social responsibility for children and young people and those with few resources, municipal responsibility through close contact to citizens, firms’ responsibility for employees, and economic responsibility with a focus on activities that provide the most value for money.

Although inequity in health has been high on the political agenda, the actions taken during the 2000s have mainly been confined to programmes that were aimed for vulnerable groups (European Portal, 2017). However, a report from the Danish National Board of Health (2011) addressed the issue and contained recommendations for action.

Finland

Finnish health policy has developed along two tracks - a ”targeted program policy” and a ”structural reform policy” - reforming the organization of the whole of health and social care. Both policies have aimed at reducing service availability as well as health and social inequality. The present Finnish public health programme is based on the Health 2015 Health Cooperation Programme (Finnish Ministry of Social Affairs and Health, 2001a) which outlines targets for the national health policy, based on WHO’s Health for All programme. The term ‘cooperation’ refers to the approach that different sectors outside health care are involved in promoting health, including NGOs. The programme contains a strategy with eight targets for public health which require concerted actions by various bodies, and 36

lines of action (Vuorenkoski, 2008). While the government has an overall responsibility for setting guidelines and monitoring the health of the population, the employers are responsible for organizing occupational health promotion for their employees, giving advice on health risks and checking the health status of the employees in case of a job-related risks, and municipalities are responsible for the environmental health policy. Public health at the municipal level is the responsibility of local health centres and includes a wide array of, for example school health service, immunization, cancer screening programmes, family planning, and environmental health services. The main undertaking has been public health campaigns in specific areas (Finnish Government, 2015).

In the 2000s the governments had various programmes targeting health and social inequality. However, "[V]arious indicators show that the health of the Finnish population has improved but socioeconomic health inequalities have generally remained or even widened. It appears increasingly difficult to reach the Health 2015 Public Health Programme goals for reducing differences in mortality by a fifth by 2015. [...] Reducing health inequalities has been an objective in the Finnish health policy programmes since 1986. [...] In recent years, health inequalities have been increasingly viewed as larger socio-political problems than just a problem of traditional health policy (e.g. in the Government Programmes of 2003 and 2007)" (Palosuo *et al.*, 2007). Moreover, in the 2000's several governments tried, with limited success, to reform the whole health and social care system.

Iceland

In 2001, a 10-year national health plan was launched in Iceland by a liberal-conservative coalition government. 21 targets from WHO's Healthy21 were adapted for Iceland, and seven priority projects were identified. It was stated that within the health care services the emphasis is placed on improving health and preventing disease, and in order to achieve this, a "coordinated effort is required on the part of the government, health care service administrators, health care professionals, special-interest organizations and NGOs" (Icelandic Ministry of Health and Social Security, 2001). The Public Health Institute was established in 2003. In 2007, a government of the same parties published a mission statement on priorities regarding general health and prevention, appealing to the "collective effort of the nation" (Icelandic Ministry of Health and Social Security, 2007). The mission statement mainly

emphasized the government's specific aims from the Health plan of 2001. A one-year pilot project was launched with the goal of increasing general access to regular exercise through the collaboration of the Ministry of Health, the Public Health Institute, the National Olympic and Sports Association of Iceland, health care centres, sports clubs and the municipalities.

In 2008, a public health policy with the main purpose of “establishing the societal conditions necessary to help individuals make choices that are beneficial to their health” was launched by a coalition government of liberal conservatives and social democrats (Icelandic Ministry of Health and Social Security 2008). Three key elements were targeted: mental health, nutrition and regular exercise. A total of 11 aims were defined, with 30 actions in total. The instrument used was mainly the provision and distribution of health-related information by means of educational material aimed at parents of newborns, teachers and children at all levels of the school system, employers, employees as well as the unemployed. In this health plan a responsible agent and the executing agent are defined for each goal specified, where schools and workplaces are encouraged to implement their own health policies. Factors other than individual behaviour that are known to contribute to health inequality, such as the distribution of income, education, employment and housing, are not addressed specifically in this public health policy – which could indicate that it was not considered a problem in this context. Individual behaviour is mainly targeted as in other white papers on public health in the 2000s in Iceland.

In a final report for the 2001 Health Plan, seven of 21 targets had been reached, seven were considered as being within reach, three had drifted further from the target, and three targets could not be estimated because of lack of information/data (Icelandic Ministry of Welfare, 2011).

While health inequity has been a research theme in Iceland, the policy addressed to tackle this inequity has been through various specific public health initiatives.

Norway

In Norway, public health activities are mainly carried out at the local level, involving GPs and municipalities, while counties take care of monitoring and strategic planning (Ringard *et al.*, 2013). In 2003 the government issued an extensive white paper on public health by a conservative-liberal

government (Norwegian Government, 2003) which was incorporated in a 10-year strategic plan. The main approach was to focus on circumstances that create health problems and circumstances that counteract ill-health while it is acknowledged that “our own choices and how we create our society within a range of areas is far more important”. The government emphasized the association between the responsibility of society and the individual and that “public health measures should be strengthened within all sectors of society through an active partnership that places responsibility and obligations and stimulates activity”. While the individual is considered as having choices and responsibility, society should influence these choices through providing knowledge and influencing attitudes. The ethical aspects thereof are discussed, and it is underlined that public health activities must be based on respect for different values which have their basis in democratic institutions involving the population at large. In a section on diagnosing the problems it is acknowledged that public health work has previously been uncoordinated and that there is a need for continuity and integration with the rest of societal planning, based to a greater extent on knowledge. One of the recommended means is to enable individuals to take responsibility through lifestyle changes and through circumstances surrounding the individual.

During the 2000s the government has introduced a number of strategies to improve health through action plans directed towards, for example, smoking, nutrition, physical activity, alcohol and drugs. A Public Health Act was introduced in 2012 to improve the coordination of public work both horizontally among various actors and vertically among authorities at the local, regional and national levels (Ringard *et al.*, 2013).

Health inequity was addressed extensively in the white paper from 2003 and again in a whitepaper from 2007 (Norwegian Government, 2007). The actions taken to reduce inequities in health have been oriented towards social determinants of health and its distribution (European Portal, 2017).

Sweden

Several organizational changes have taken place in the public health area in Sweden since the turn of the millennium. The Public Health Institute was reorganized in 2001. Following a number of reports from the National Committee for Public Health in the late 1990s, the social democratic government in 2002 issued a white paper on public health (Swedish Government 2002??), and in the following year

the government adopted a programme covering 11 domains, which were seen as the most important determinants of Swedish health, and which would guide the public authorities involved (Anell *et al.*, 2012).

In the 2006 elections, government power shifted to a liberal-conservative coalition. In 2008, the new government issued a white paper on "a renewed public health policy" (Swedish Government, 2008), which was followed by a renewed public health bill. While the 2002 programme emphasized the causes of social health inequalities, the new programme expressed the view that one of the central tasks for government is to provide information in a form that will "enable people to voluntarily change their behaviour", emphasizing individual choice and responsibility along with living conditions. The Public Health Report in 2010 states that "[t]he overriding objective of public health is to create the social conditions for good health on equal terms for the entire population" (Statens Folkhälsoinstitut, 2010). The report divides the eleven public health target areas into three strategic areas: 1) good living conditions, 2) health promoting living environments and living habits and 3) alcohol, illicit drugs, doping, tobacco and gambling.

On 1 January 2014, The Public Health Agency of Sweden (*Folkhälsomyndigheten*) was formed through the merger of The Swedish Institute for Communicable Disease Control and The Swedish National institute of Public Health. The agency is "an expert authority with responsibility for public health issues at a national level." The target groups are local government and national government entities at various levels. On the web-page of the Agency ("about us") you will find the wonderfully Swedish statement "Everybody has the right to feel well". Concomitantly, private provision of health care has increased in importance, while the supervision of the social insurance system (2009) and of Swedish health care (2013) has been entrusted to two new government agencies.

It has been a goal for the Swedish governments to reduce inequity in health since the mid1990s. Focus has been on social determinants and cross-sectoral collaboration. The overall goal has been to "achieve societal conditions for a good health for all on equal conditions" (European Portal, 2017).

3. Public health policies in Germany and the UK.

Germany

The German health care system is characterized by a pluralistic and decentralized organization. The important actors are organized in corporatist bodies such as the national association of sickness funds, the national and regional associations of physicians, and the German Hospital Federation. In a system of self-governance, they organize many aspects of health care provision. They are supervised by the federal and state (*Länder*) authorities.

In public health, the sickness funds of the statutory health insurance system play an important role. Since 2002, they can introduce Disease-Management Programs (DMPs) for chronic diseases (asthma, breast cancer, COPD, diabetes type I and II, ischaemic heart disease). The objective of these programs is to improve care for the chronically ill following evidence-based guidelines. DMPs coordinate services among different providers, mostly at the ambulatory care level. Sickness funds reimburse providers for the additional services provided for the DMPs. The number of participants rose rapidly from 1.31 million in 2004 to 6.21 million in 2009 (van Lente 2010). In 2012, more than 10,000 programs existed with 7.16 million participants (Kifmann 2017).

Sickness funds are also responsible for promoting primary prevention. In 2007, occupational health promotion was included in the benefit package. A benchmark expenditure is defined which sickness funds must spend on primary prevention and occupational health promotion. Expenditure on these activities amounted to around €300 million in 2010. Spending rose from €1.10 per person in 2000 to €4.33 in 2010. Around 12 million individuals participated in programs on primary prevention and occupational health promotion in 2010 (Busse and Blüml, 2014).

Furthermore, health targets are established by the forum “Gesundheitsziele.de” (Gesellschaft für Versicherungswissenschaft und -gestaltung e.V., 2017). Supported by the federal and state governments, this forum aims at developing joint targets and defining coordinated strategies. Around 140 organizations are members of this initiative. Between 2002 and 2012, seven national health targets were established:

- (1) Diabetes mellitus Type 2: lowering the risk of disease, early recognition and treatment (2003)
- (2) Breast cancer: lowering mortality, improving quality of life (2003)
- (3) Reducing tobacco consumption (2003)
- (4) Grow up healthy: life competence, physical activity, nutrition (2003; revision 2010)
- (5) Increasing health competence, strengthening patient sovereignty (2003; revision 2011)
- (6) Depressive diseases: prevention, early diagnosis, effective treatment (2005)
- (7) Healthy ageing (2012)

The forum has developed objectives and proposals for practical implementation for each health target. These take the form of recommendations for the stakeholders involved at the local level. Thus, while programmes for specific health problems have been formulated, the overall public health policy seems to play a less prominent role (Busse and Blümel, 2012).

Equality of access is something that is aimed for within a given insurance scheme, where it is specified as “solidarity” meaning access to all who have contributed with premiums and their dependents. No specific action plan at the central level has hitherto been in place to deal with health inequity (European Portal, 2017)

United Kingdom

The responsibility for organizing the health services in the United Kingdom (UK) was decentralized to its four constituting nations (England, Northern Ireland, Wales and Scotland) in 1997. Although details of how the services are organized vary, the main characteristics of a national health service as described above has been kept in all four nations. Public health policies in each nation serve to strengthen and coordinate health protection. The key elements are health protection programmes (e.g., immunization), health improvement programmes (e.g., smoking cessation) and reducing health inequalities, (Cylus *et al.*, 2015). The responsibility public health policies rests with the Department of Health in England (and equivalent authorities in the other countries) and local authorities. Services are provided through the NHS, local authorities and other groups. While a range of health priorities and interventions are common across the four nations in the UK, some priorities have been developed

separately within each nation. Still, the overarching goal across the four nations is: “to provide equitable, safe, effective, cost-effective, high-quality health care” (Cylus *et al.*, 2015).

In the “Health of the Nation” the English government sets targets for a number of specific health conditions, such as coronary heart disease and stroke, cancer, mental illness, HIV/AIDS, sexual health and accidents (Secretary of State for Health, 1992), and later reports from the Secretary of State for Health (1998, 1999) set new targets to be achieved by 2010 (Boyle, 2011). Local health authorities were required to make plans for reducing inequalities in health in “Reducing Health Inequalities: an Action Report” published by the Secretary of State for Health (1999). Socio-economic inequalities in health were further addressed in the “NHS Plan 2000” from the Department of Health wherein a combination of actions was suggested. Further initiatives included monitoring of disease prevention and health promotion programmes, health and inequalities (Department of Health, 2004). Later initiatives focussed on changing lifestyle behaviour (e.g., smoking cessation) (Department of Health 2004a). To promote better health and well-being for all five indicators, ten national health priorities were set forth by the Department of Health in 2009 (Department of Health, 2009). Further initiatives were launched in the area of health protection with the establishment the Health Protection Agency (2004) to reduce the dangers to health from infectious diseases as well as chemical and radiation hazards. While directions for public health are set nationally, the actions are increasingly taking place at the local level. Inequity in health has been a key focus area since Acheson’s report (Acheson, 1998), followed by Marmot’s report in 2010 (Marmot, 2010). Policies to reduce inequity in health can also be found in Scotland, Ireland and Wales (European Portal, 2017).

In summary, the National Health Service in the UK has similar characteristics as the Nordic systems with an emphasis on health promotion and equality of access. Health policy in the UK is comprehensive, and responsibility is centralized to a large extent.

4. Data

For a quantitative comparison of health and inequality in health the Nordic countries, data from the European Social Survey (ESS) were applied (European Social Survey, 2017). For Denmark, Finland, Norway and Sweden, data from Round 1 of 2002 were applied together with data from Round 2 of

2004 for Iceland, as data were not collected in Round 1 for Iceland. Results from these rounds are compared to results from Round 6 of 2012, in which all countries participated. Furthermore, we use OECD data to describe non-medical determinants of health and life expectancy. Health is measured by a self-assessed health variable with five categories which were converted to a cardinal scale using a Swedish scale developed by Burström *et al.* (2014). The authors used a time trade-off (TTO) model, based on EQ-5D health states, which were afterwards used to assign scales to the SAH categories (see the authors for details).

According to these authors, the following weights were applied to health status categories: Very good = 1 (reference); good = 0.9685; fair = 0.8586; bad = 0.6811; very bad = 0.5183.

The post-sample design weights provided by the ESS variable PSPWGHT were applied to all calculations based on ESS data. These weights account for pre-sampling design representativeness issues and further adjust for post-sampling representativeness shortfalls (European Social Survey 2017). Table 1 shows some descriptive statistics for the sample. Descriptive aggregate data from the OECD Statistics are selected for the same years.

Variable	Denmark		Finland		Iceland		Norway		Sweden		UK		Germany	
	2002	2012	2002	2012	2004	2012	2002	2012	2002	2012	2002	2012	2002	2012
Household income ¹	17866	22457	12710	16711	21294	16400	21055	32496	13716	19696	17019	15592	13818	14273
Educational ²	1 3	1 3	1 2	12 2	1 3	1 3	1 3	13 9	12 1	1 2	1 2	1 3	12 9	1 3
Age	47	50	47	50	46	44	46	44	47	49	48	52	48	50
Male %	53	52	53	52	48	51	54	51	52	52	47	43	48	52
N	1281	1407	1790	2058	480	641	1970	1552	1864	1664	1759	1772	2316	2545
Notes.														
1. Income is in nominal prices. Annual household income in € is reported as 10 percentiles, equalized by the OECD/Eurostat formula: $1+0.7*(adults-1) + 0.3*children$. For the percentiles, percentile monetary values are used. For other deciles, monetary values of decile mid-point are used.														
2. Self-reported number of years of full-time education.														
3. The decrease from 2002 is due to different definitions of income deciles in EES.														
Source: Own calculations, based on ESS data. European Social Survey (2017).														

5. Methods

In the present study socio-economic related inequality in health is calculated by a concentration index showing either income-related inequality or education-related inequality in self-assessed health. The measure is relative to the mean of income or education in a given country which may vary from country to country. The index is described in a number of earlier studies, for example, van Doorslaer *et al.*, (1997) and van Doorslaer and Koolman (2004), and is briefly summarized below. A concentration curve shows the cumulative share of a sample (ranked by socioeconomic status (SES) from lowest to highest) against the cumulative share of total health. If the curve coincides with the diagonal, everybody has the same health. If it is below the diagonal, there is an inequality in health to the advantage of the higher socioeconomic groups, and vice versa in case the curve lies above the diagonal. The index is measured by twice the area between the diagonal and the concentration curve. The greater the distance between the curve and the diagonal, the greater the inequality. The index varies between -1 and +1 for the hypothetically extreme situations where total health is concentrated either at those with the poorest or the highest socioeconomic status.

A calculation formula for the concentration index C which allows application of sample weights has been described by Kakwani *et al.*, (1997):

$$C = \frac{2}{n\mu} \sum_{i=1}^n w_i y_i R_i - 1,$$

where $\mu = \frac{1}{n} \sum_{i=1}^n w_i y_i$ is the weighted average of health, n is sample size, y_i is health, w_i is sample weights of individuals, which adds to n , and R_i is the rank order, expressed as a fraction, defined by Kakwani *et al.* as

$$R_i = \frac{1}{n} \sum_{j=1}^{i-1} w_j + \frac{w_i}{2},$$

which is the cumulative fraction of the population up to the mid-point of each weight.

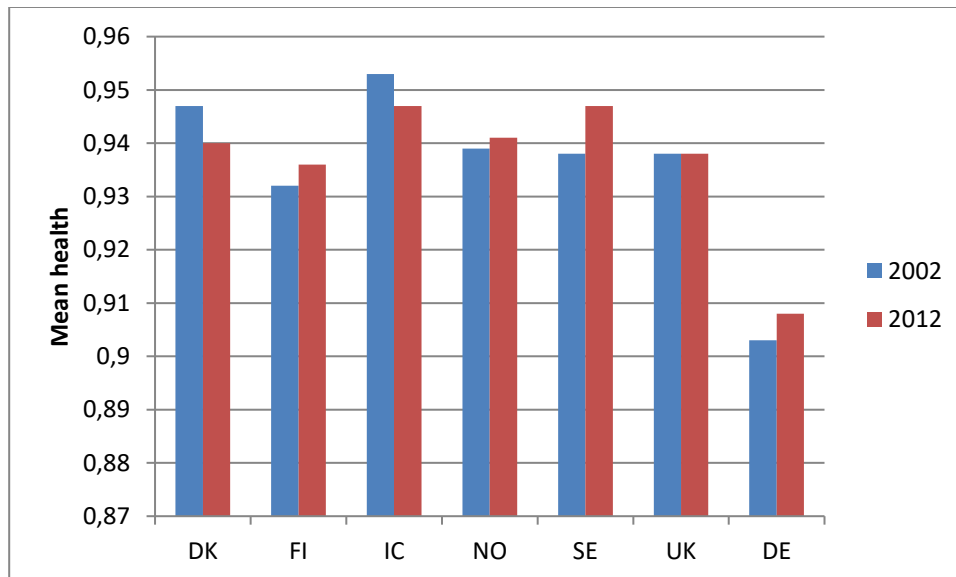
Post sample weights were used to weight results. Given that the calculation of the concentration index does not allow for weights being incorporated directly, the approach of van Doorslaer *et al.* (2004) was used; i.e., the weight for each observation was recalculated into $w_i = \text{round}(w_i / \min_{j=1}^n (w_j))$, and the observation was duplicated the number of times given by this number.

6. Results

Health

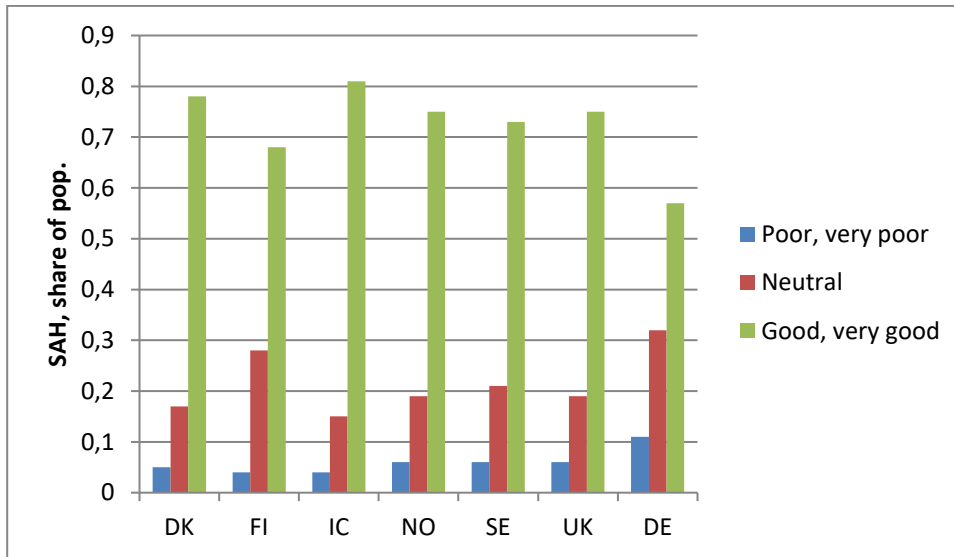
Mean health, based on self-assessed health reported in five categories and weighted by TTO weights, is shown in Figure 1. The level is above 0.93 in all Nordic countries and the UK in 2012, while being lower in Germany. The highest level was reached in Iceland in 2004 and Sweden in 2012. Only minor changes took place since 2002 in each country. Mean health and confidence intervals are shown in Table 2.

Figure 1. Mean health on a 0–1 scale, based on self-assessed health with health categories weighted by TTO weights. The Nordic countries, UK and Germany, 2002 and 2012.



Source: European Social Survey 2002 and 2012. (European Social Survey, 2017)

Figure 2. Self-assessed health status by category in the Nordic countries, UK and Germany, 2012.



Source: *European Social Survey 2012 (European Social Survey, 2017)*

The distribution of categories of self-assessed health 2012 according to ESS data is shown in Figure 2. The average of combined categories “good” and “very good” is above or about 0.70 in all Nordic countries as well as the UK, while in Germany the share is below 0.60. The share with poor or very poor health is lowest in Finland, Iceland and Sweden, while Germany has a higher share, followed by the UK. Minor changes have taken place since 2002 according to Table 2.

Female life expectancy (LE) is shown in Figure 3. It has increased about equally in all countries and has reached more than 84 years in Iceland, followed by Finland and Sweden. Denmark is at the lowest level with 82 years, while UK and Germany have reached a level of about 83 years. As can be seen from Table 2, the gender difference in LE has decreased since 2002, and male LE is between 2.7 and six years lower than female LE in the Nordic countries in 2012.

Table 2. Socio-economic inequalities in health and mean health. Nordic countries, UK and Germany 2002 (Iceland 2004) and 2012

Variable	Denmark		Finland		Iceland		Norway		Sweden		UK		Germany	
	2002	2012	2002	2012	2004	2012	2002	2012	2002	2012	2002	2012	2002	2012
Mean of Health	0,947	0,940	0,932	0,936	0,953	0,947	0,939	0,941	0,938	0,947	0,938	0,938	0,903	0,908
(TTO)	(0.945, 0.950)	(0.938, 0.942)	(0.929, 0.935)	(0.933, 0.938)	(0.949, 0.957)	(0.943, 0.951)	(0.937, 0.941)	(0.938, 0.944)	(0.935, 0.940)	(0.945, 0.949)	(0.938, 0.939)	(0.936, 0.940)	(0.901, 0.905)	(0.907, 0.909)
SAH=very poor, poor	0,05	0,05	0,04	0,03	0,04	0,04	0,06	0,06	0,06	0,04	0,06	0,07	0,11	0,10
	0.04, 0.06)	(0.04, 0.06)	(0.03, 0.05)	(0.03, 0.04)	(0.03, 0.05)	(0.03, 0.05)	(0.06, 0.07)	(0.05, 0.07)	(0.05, 0.06)	(0.03, 0.05)	(0.06, 0.06)	(0.06, 0.07)	(0.10, 0.12)	(0.09, 0.10)
SAH=neutral	0,17	0,21	0,28	0,26	0,15	0,18	0,19	0,17	0,21	0,17	0,19	0,18	0,32	0,31
	(0.16, 0.18)	(0.20, 0.23)	(0.26, 0.30)	(0.24, 0.27)	(0.13, 0.17)	(0.17, 0.20)	(0.18, 0.20)	(0.15, 0.18)	(0.19, 0.22)	(0.16, 0.18)	(0.18, 0.19)	(0.17, 0.19)	(0.31, 0.33)	(0.31, 0.32)
SAH=good, very good	0,78	0,74	0,68	0,71	0,81	0,78	0,75	0,77	0,73	0,79	0,75	0,75	0,57	0,59
	(0.76, 0.79)	(0.72, 0.75)	(0.66, 0.70)	(0.69, 0.73)	(0.79, 0.83)	(0.75, 0.81)	(0.74, 0.76)	(0.76, 0.79)	(0.72, 0.75)	(0.78, 0.80)	(0.75, 0.76)	0.74, 0.77)	(0.56, 0.58)	(0.58, 0.60)
SAH45, lower income, pct.	0,696	0,638	0,57	0,624	0,615	0,735	0,609	0,697	0,666	0,712	0,644	0,66	0,48	0,493
SAH45, upper Income, pct.	0,817	0,826	0,783	0,775	0,851	0,876	0,793	0,868	0,782	0,841	0,822	0,836	0,648	0,686
LE, females ¹	79,4	82,1	81,6	83,7	82,5	84,3	81-6	83,5	82,1	83,6	80,6	82,8	81,3	83,3
Difference F-M ¹	4,6	4,0	6,7	6,0	3,9	2,7	5,2	4,0	4,4	3,7	4,6	3,7	5,6	4,7
Overweight*	32,2	33,3	33,5	34,1	35,9	37,5	34	36	34,4	35,3			36,3	36,7

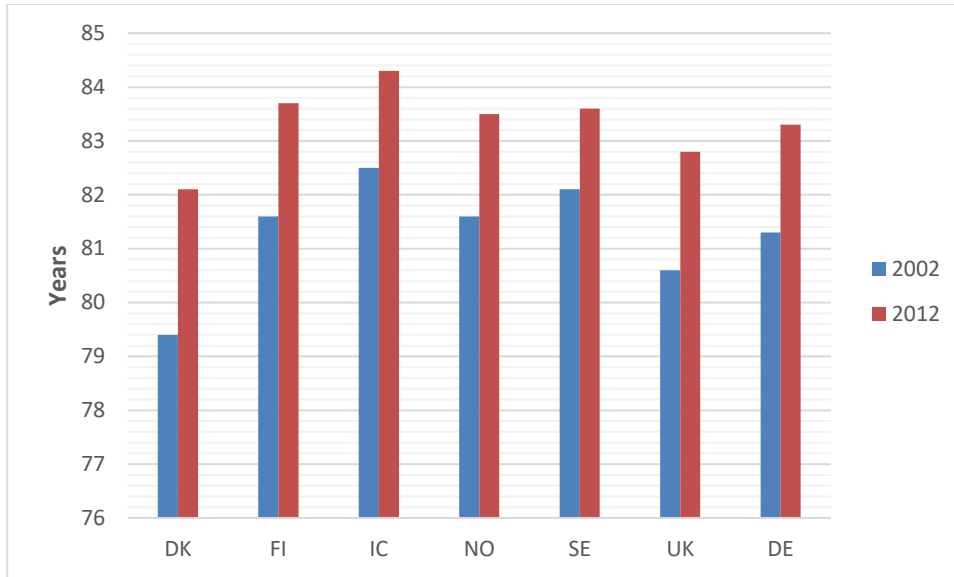
		0,231		0,237		0,172		0,223		0,219		0,304		0,25
Gini coefficient		(0.227, 0.234)		(0.232, 0.241)		(0.167, 0.179)		(0.218, 0.228)		(0.215, 0.222)		(0.300, 0.308)		(0.248, 0.251)
Concentration index, C, ranked by income	0,008	0,011	0,01	0,007	0,009	0,002	0,01	0,01	0,007	0,007	0,012	0,012	0,009	0,011
	(0.006, 0.009)	(0.010, 0.012)	(0.009, 0.012)	(0.005, 0.009)	(0.007, 0.012)	(0.000, 0.005)	(0.009, 0.012)	(0.008, 0.012)	(0.005, 0.008)	(0.005, 0.009)	(0.011, 0.012)	(0.011, 0.013)	(0.008, 0.011)	(0.011, 0.012)
Concentration index, C, ranked by income	0,008	0,011	0,01	0,007	0,009	0,002	0,01	0,01	0,007	0,007	0,012	0,012	0,009	0,011
	(0.006, 0.009)	(0.010, 0.012)	(0.009, 0.012)	(0.005, 0.009)	(0.007, 0.012)	(0.000, 0.005)	(0.009, 0.012)	(0.008, 0.012)	(0.005, 0.008)	(0.005, 0.009)	(0.011, 0.012)	(0.011, 0.013)	(0.008, 0.011)	(0.011, 0.012)
Sample size, N	1281	1407	1790	2058	480	641	1970	1552	1864	1664	1759	1772	2316	2545

Notes. Income is in nominal prices. ESS results are weighted with ESS post-sample weights. 95% confidence interval in brackets.

¹ Based on OECD Statistics (*OECD 2017*); * refers to the years 2002 and 2011.

Source: *European Social Survey 2002 and 2012. (European Social Survey, 2017).*

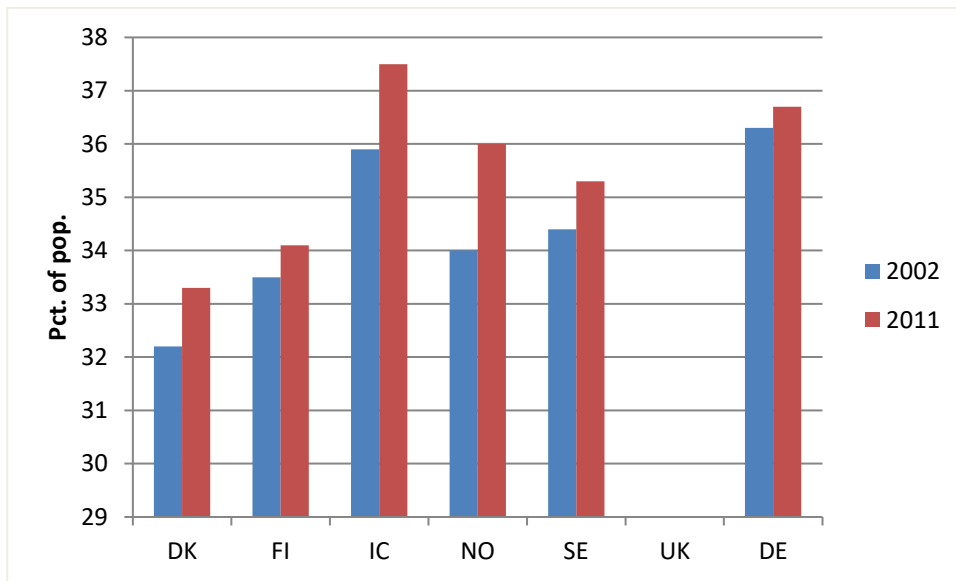
Figure 3. Life expectancy, females at birth, Nordic countries, UK and Germany, 2002 and 2012.



Source: OECD Statistics (OECD, 2017).

Overweight defined as $BMI \geq 25$ has increased in all included countries during the decade. In 2011, it varied between 33 per cent of the population in Denmark and 38 per cent in Iceland, followed by Norway and Sweden. The level in Germany lies slightly below Iceland. Overweight by country is shown in Figure 4 and documented in Table 2.

Figure 4. Overweight as share of the population in the Nordic countries and Germany, 2002 and 2011

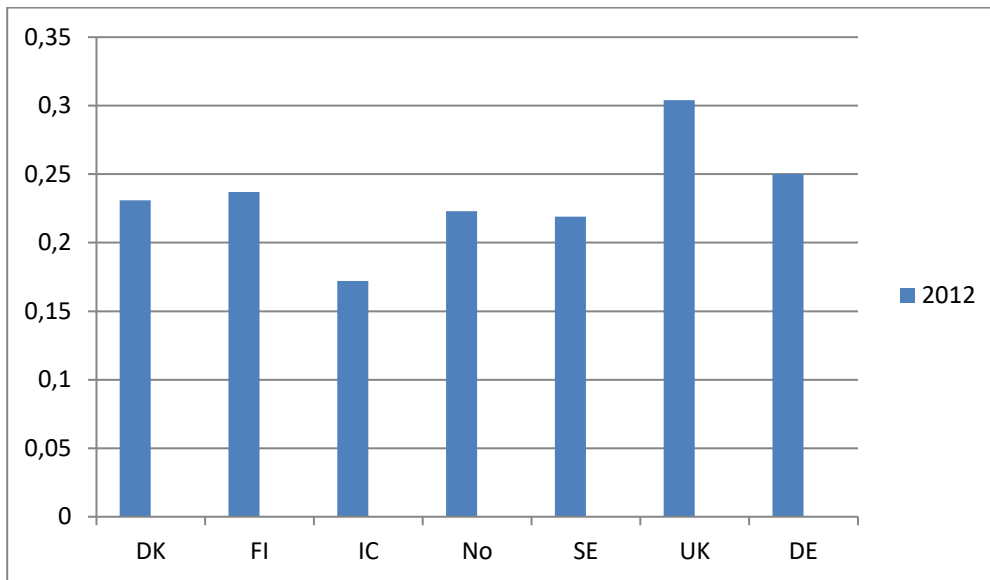


Source: OECD Statistics, (OECD, 2017a)

Income distribution

Inequality in income as measured by the Gini coefficient is shown in Figure 5. The coefficient in Denmark, Finland, Norway and Sweden are about the same level while Iceland lies below and the UK and Germany lie above. Thus, income inequality in the Nordic countries is below the level of the benchmarking countries. Data are documented in Table 2. While a skewed distribution of income does not in itself lead to inequality in income-related health, such a relationship would arise if income and health are associated. Earlier studies have indicated that although social welfare state like the Scandinavian countries have relatively low inequality in income, there is no corresponding low income-related inequality in health as shown by Dahl et al. (2006) and Lahelma and Lundberg (2009).

Figure 5. Income inequality as measured by the Gini coefficient. Based on equivalized household income in the Nordic countries, UK and Germany, 2012.

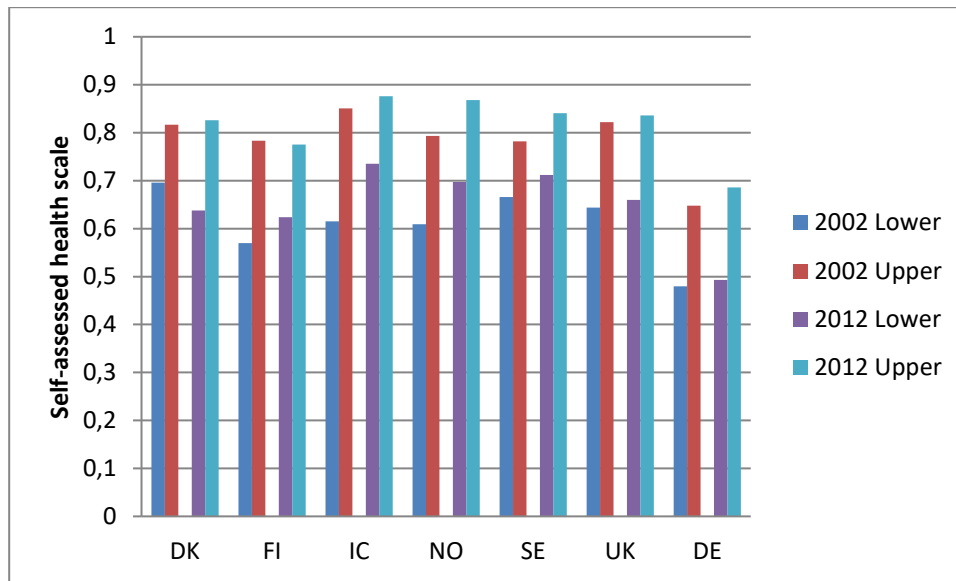


Source: *European Social Survey 2012 (European Social Survey, 2017)*.

Income- and education-related inequality in health

Figure 6 shows the percentage of respondents reporting good or very good self-reported health by countries and income group (lower half versus upper half). Different patterns are seen. For Denmark, the percentage among the lower income group has reduced from 2002 to 2012, while the percentage has increased for the upper income group. For Germany, the percentage has increased for both groups, but the increase is larger for the upper than for the lower income group. Thus, inequality in health has increased for Denmark and Germany. For Finland, Iceland, Norway and Sweden, the percentages rose faster for the lower income groups than for the upper ones, thus indicating reductions in inequality. For UK, both income groups had approximately the same increase from 2002 to 2012, which indicates that inequality was unchanged over time.

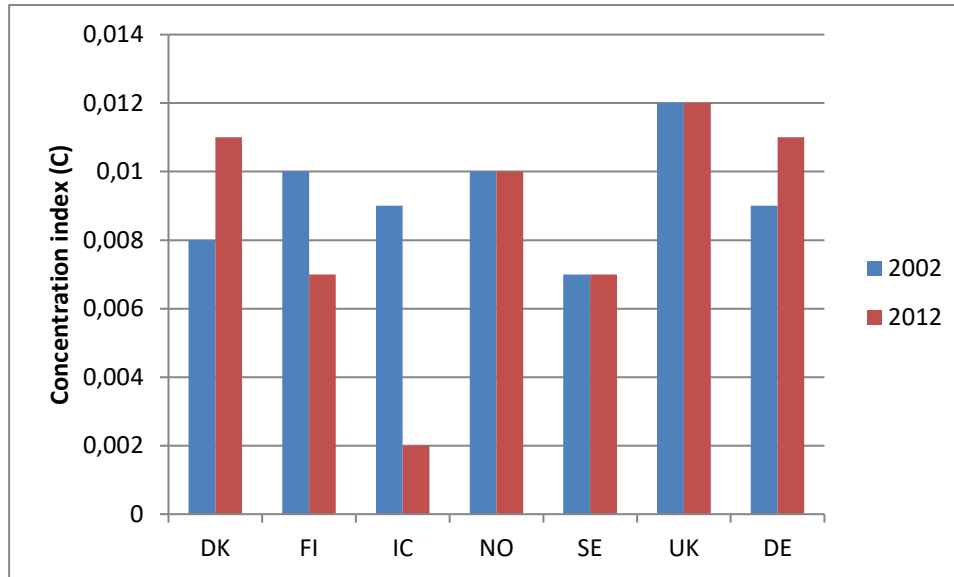
Figure 6. Good and very good self-assessed health in lower and upper half of income groups in the Nordic countries, UK and Germany, 2002 and 2012



Source: *European Social Survey 2012 (European Social Survey, 2017)*

Figure 7 compares income-related inequality in health among the Nordic countries as measured by the concentration index. These results, together with confidence intervals, are documented in Table 2. By comparing these confidence intervals, it can furthermore be assessed whether differences in concentration indices are significant. When the indices for two years are compared, it has to be taken into consideration that the populations may have changed over time. Similarly, when we compare countries, the population composition may be different, and hence results should be interpreted with caution. While in 2012 the concentration index is relatively low in Iceland, Finland and Sweden and significantly lower than in the benchmark countries, it is higher in Denmark and Norway. Still, the indices for the UK and Germany are higher, although not significantly so than in Denmark and Norway. The indices have increased significantly for Denmark and Germany since 2002, while they have decreased significantly for Finland and Iceland. For Norway, Sweden, Germany and the UK, the concentration indices are unchanged.

Figure 7. Income-related inequality in self-assessed health as measured by the concentration index (C), Nordic countries, UK and Germany, 2002 and 2012.



Source: European Social Survey 2012 (European Social Survey, 2017)

The histogram in Figure 6 shows a social gradient when we compare lower and upper income groups for a given country, which is easily interpreted (for example, a difference between 0.7 and 0.8 on a self-assessed scale for Denmark in 2002). The concentration indices in Figure 7 are based on a distribution of self-assessed health over the whole range of income. In the case of Denmark in 2002, the figure provides an index of 0.008 and, when illustrated in a graph, the concentration curve almost coincides with the diagonal and shows no substantial income-related inequality in health. Due to the curve being close to the diagonal, it is not shown in a figure. Hence, the two approaches – the social gradient and the concentration curve – give different impression of income-related inequality in health, although the figures are based on the same data.

We calculated the concentration index for education-related inequality in health and found comparable results with a concentration curve very close to the diagonal in all countries showing no substantial education-related inequality in health.

Non-medical determinants of ill-health

As shown in Table 3, health inequality exists among income groups, although it is very small when weighted by preference weights. One interesting question would be how far the Nordic countries have come in reducing non-medical determinants of ill-health, in particular life-style related determinants of ill-health. Among data from OECD Statistics (OECD 2017a), we show the consumption of tobacco, alcohol, sugar and fat in Table 3.

The consumption of tobacco has decreased in all countries except for Finland since 2002. The level in the Nordic countries lies between the UK with the lowest level and Germany with the highest level. The level for Sweden in 2011 is not available due to the extensive use of snuff as a substitute for tobacco.

Alcohol consumption has decreased in Denmark, but from the highest level among the compared countries. For the other Nordic countries there were some increases. For UK and Germany the consumption decreased, but also from a relatively high level.

The consumption of sugar varies substantially among the countries. An extreme level is found for Denmark with more than 50 kg per person per year, while in Finland the consumption is 30 kg. The other countries have a level in between, and it decreased in all countries except for the UK.

Fat consumption has increased in all countries during the decade studied. It varies between 132 g/person/day in Denmark and Sweden and 150 g in Norway. UK and Germany lie between these extremes.

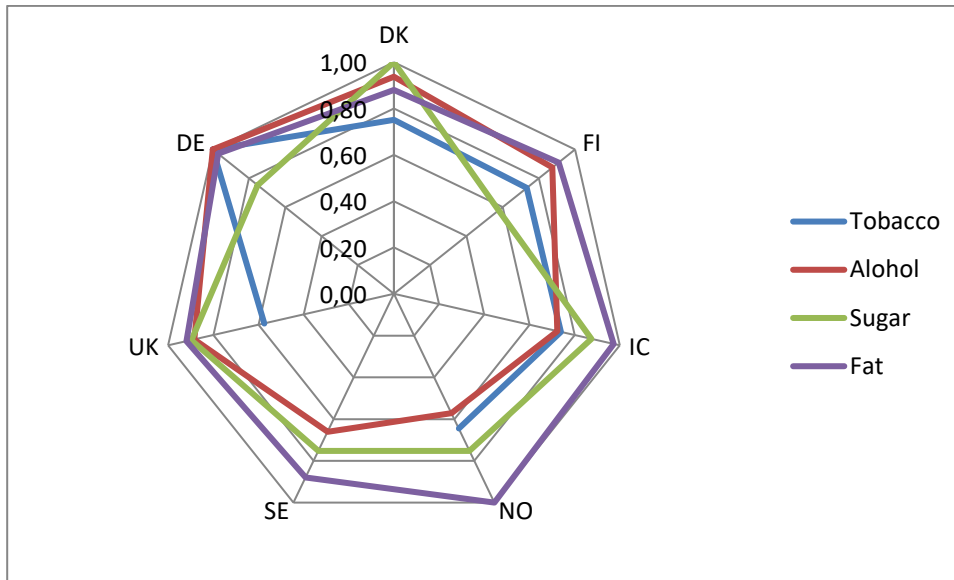
Table 3. Consumption of tobacco, alcohol, sugar and fat, Nordic countries, UK and Germany, 2002 and 2011

Substance	Units		Denmark	Finland	Iceland	Norway	Sweden	UK	Germany
Tobacco	g/capita/year (15+ years)	2002	1522	1012	1724	1391	1713	1224	2396
		2011	1250	1221	1230	1073	n.a.	955,4	1664
Alcohol	(15+ years)	2002	13,1	9,2	6,6	5,9	6,9	11,1	12,3
		2011	10,5	9,8	8,1	6,4	7,4	9,9	11,2
Sugar	kg/capita/year	2002	57,6	34,8	52,3	44,3	42,1	41,1	45,2
		2011	53,3	30,8	46,6	40,1	40,1	47,8	40,1
Fat	g/capita/day	2002	130,4	127,5	137,9	145,7	125,1	135,4	139
		2011	132,3	136,7	146,2	150,3	132,1	138,1	145,8

Source: OECD (2017a)

The cobweb diagram in Figure 8 shows the distribution of each of the four non-medical determinants of health by country. Each determinant is shown by an index relative to the highest value among countries. For example, tobacco consumption is shown relative to the consumption in Germany, where it is the highest. Germany appears to be relatively high on three of the determinants, followed by the UK and Denmark.

Figure 8. Relative distribution of non-medical determinants of health by country, 2011.



Source: Based on OECD Statistics (2017a).

Resources allocated to health

Human resources allocated to healthcare and expenditure on health are shown in Table 4, based on OECD (2017b). The share of the population employed in health care varies substantially from country to country. Among the Nordic countries it increased in Finland and Norway during the decade, while it decreased in the other Nordic countries. The lowest level in 2012 is seen in Iceland, the UK and Denmark, all with about 6 per cent. Norway has by far the highest share close to 11 pct. Definitions may vary between countries, however.

The share of GDP used for healthcare has increased in all countries except for Iceland. Sweden has the highest share close to 11 per cent, followed by Denmark. Norway has the lowest share, but of the highest GDP. Denmark, Finland and Iceland are at a level between the UK and Germany in 2012.

Table 4. Human resources in health care and expenditure on health in the Nordic countries, UK and Germany, 2002 and 2012

Units			Denmark	Finland	Iceland	Norway	Sweden	UK	Germany
Employed	Pct. of pop	2002	9,29	6,06	7,65	9,64	8,87	3,75	4,56
	Pct. of pop	2012	8,89	7,56	6,02	10,86	7,54	6,16	6,06
Current expend.	US doll/capita	2002	2750	2100	3078	3398	2575	2060	2870
		2012	4545	3759	3506	5738	4860	3492	4675
Current expend.	Pct. of GDP	2002	8,7	7,4	9,6	6,1	8,4	6,8	10,1
		2012	10,3	9,3	8,7	6,2	10,9	8,5	10,8
Out-of-pocket	US doll/capita	2002	405	469	572	572	433	236	358
		2012	586	705	629	849	749	340	663

Source: OECD (2017b)

Current expenditure on health, measured in US dollars, is by far the highest in Norway with more than 5700 dollars, followed by Sweden and Denmark. Denmark is at the level of Germany while Iceland is at the level of the UK. Out-of-pocket expenditure on healthcare has increased in all countries with the highest levels being found in Norway and Sweden in 2012.

6. Discussion and conclusion

White papers and government reports on public health from the various Nordic countries all show that public health has become an important policy issue during the last two decades or more. This development has undoubtedly been influenced by international trends, in particular trends that have been formulated by the WHO, as witnessed by direct references in some white papers. But in the Danish case the stagnation in life expectancy during the 1980s and early 1990s as analysed by the

Government's Committee on Life Expectancy (Bjerregaard, 1994) has given impetus to improve public health.

As documented by Vallgård (2007, 2010, 2011) there are some differences among the countries with respect to the interpretation of public health problems, and the approaches seem to have changed somewhat over time within each country. How this has influenced legislation and actual efforts has yet to be explored. Thus, we can only conclude from the documents that public health with some variation in approaches has been high on the political agenda during the last two decades. While institutes of public health were established during the 20th century to monitor the health of the populations (except for Iceland, which established an institute in 2003), an increasing professionalization of the public health workforce has taken place through the establishment of public health education programmes during the last two decades.

Mean health and share of the population with good or very good health is higher in the Nordic countries and the UK, as compared to Germany which may support a tentative hypothesis that centrally initiated public health activities matter. However, life expectancy in Germany is similar to what is found in the other countries with centrally initiated public health activities. An exception is Denmark which introduced policies to counter smoking and excessive alcohol consumption relatively late. Recurrent efforts have succeeded in increasing the Danish life expectancy since the mid-1990s in step with the other Nordic countries, but there is still a gap between Denmark and these countries in life expectancy.

Another spectacular development is overweight which has increased in all Nordic countries during the decade studied. There is, however, no indication of Iceland being an outlier in terms of the four non-medical determinants of health that is reported.

Mean self-assessed health in the Nordic countries as weighted by the TTO weights developed for Sweden by Burström *et al.* (2014) is relatively close together with few statistically significant differences, and higher than in Germany. We use Swedish weights assuming that respondents in other Nordic countries would assign the same weights to the five response categories of self-assessed health. The levels and their statistical variations are between 0.93 and 0.95 on a scale from 0 to 1 in 2012.

Substantially, this may be considered as a state of affairs with good accomplishments, although some improvements are still possible.

A comparison of percentages reporting good or very good health across the lower and the upper income halves indicates that health inequality increased in Germany and Denmark between 2002 and 2012. However, while the change in Germany was Pareto optimal in the sense that the percentage in both income groups increased, although with a faster increase for the upper income group, the same was not true for Denmark, as the percentage reporting good or very good health dropped in the lower income group, while it increased in the upper group. For the remaining Nordic countries (Finland, Iceland, Norway and Sweden), the percentage reporting good or very good health rose faster in the lower income group than in the upper one, thus indicating a reduction in inequality. For the UK, the changes in percentage for the upper and lower income groups were similar, thus indicating unchanged inequality.

We found very low concentration indices in all countries, although they are statistically significantly different from zero. These results are not surprising in the light of what has been found in earlier international studies, for example by van Doorslaer *et al.* (1997). One may assume that inequality in income may be associated with socio-economic inequalities in health. Our results show that income-related inequalities in health in the Nordic countries are similar or lower than in less egalitarian countries like Germany and the UK. The differences across countries as well as tendencies over time in the concentration indices are comparable to those shown for percentages reporting good or very good health across lower and upper income groups.

It has been indicated by former studies (Brekke and Kverndokk, 2012) that the concentration index may be a misleading measure of health inequality, as a reduction in income inequality (in the sense that income is transferred from the rich to the poor) may lead to an increase in the concentration index, given that those with better health are lifted from the lower income percentiles. However, a comparison of the 2012 Gini and concentration indices is not much supportive of this, as the countries with the lower Gini tends to be those with the lower concentration indices also (with a rank correlation between the two series of around 0.5). Anyway, we are aware that this cross sectional relationship may not necessarily imply a causal relationship. For the case of Denmark and Germany, health inequality rose over time, which may support the suggestion, but the increases are in concert with the distribution of

percentages discussed above reporting good or very good health across income groups, where it was shown that the percentage rose faster for those in the upper income group than for those in the lower. Also, the unchanged health inequality for the case of the UK is neither supportive of the suggestion.

The Gini coefficient is shown for 2012 only because 2002 data are not comparable. While ESS reports income in 12 percentiles in 2002, income is reported in deciles in 2012. However, most other results, including concentration indices, are based on income ranks, which are less sensitive to the number of percentiles. The Gini coefficients are lower in the Nordic countries than in Germany and the UK.

We used two approaches to analyse socioeconomic differences in health - one comparing health in two different socioeconomic groups (low and high), the other by computing the concentration index. The first approach is a traditional approach (see for example OECD (2016, p. 72-73)), which uses only limited information (average health in two groups). The concentration index approach is based on information about the whole range of socioeconomic groups (or individuals ranked by socioeconomic status), and their self-reported health status is weighted by a scale that expresses preference weights. Thus, the information contained in this method is more comprehensive. There is no contradiction between results from these two approaches, as they are related to different questions. However, it is important to be aware of the different impressions that are provided by the two approaches.

The analysis of non-medical determinants of health, which have often been seen as indicators of health behaviour, shows great variation among the countries. Along with traditional determinants, such as tobacco, alcohol and fat, the consumption of sugar is included because it has been shown that excessive intake of sugar leads to a risk of overweight. Similar results were found by Asgeirsdottir (2016), who concluded that in spite of the often perceived homogeneity of the Nordic populations, there are interesting differences that need to be further explored. Due to the cross-sectional nature of the data, the present study does not allow any causal relations between these determinants and health. But it can be concluded from the observed differences that more can be accomplished in terms of reducing these risk factors. Still, a higher level of most risk factors was found in Germany and the UK.

Resources in health care vary substantially among the countries. Some of this reflects variation in income. Norway with the highest GDP has the greatest share of population employed in health care and the highest expenditures measured in US dollars, but the lowest share of GDP. Although OECD

uses common definitions, what is included may differ from country to country. We found no significant association between the use of resources and various measures of health.

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