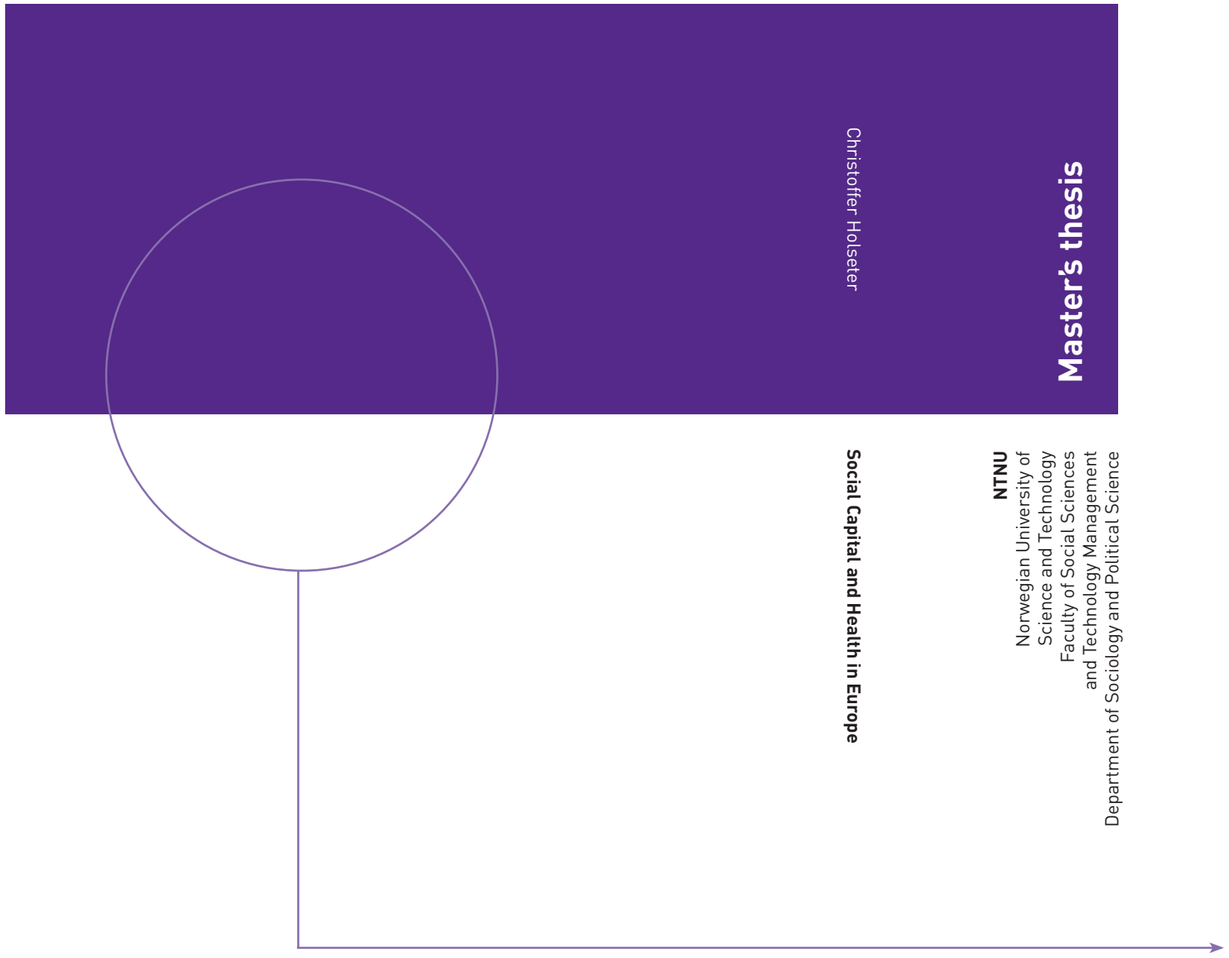

Christoffer Holseter

Social Capital and Health in Europe

The potential reduction of all-cause mortality by eliminating educational differences in social capital in 16 European nations

Master's thesis in sociology

Trondheim, July 2014

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Department of Sociology and Political Science

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Foreword

The number of topics I would like to discuss in this thesis is almost unlimited, and unfortunately, there are only a limited number of pages where I can investigate the problem of interest. The field of social determinants for health is a lot to take in and I will therefore try to keep this foreword as short as possible. There are, however, several people who deserve to be mentioned with special thanks. Either they have contributed with help and support in the making of my thesis, or they have inspired me through their works to take up the public health path. First I would like to thank Professor Kristen Ringdal and Professor Terje A. Eikemo for introducing me to the field of health inequalities with their course SOS2008 'Social inequalities and welfare' in the spring of 2011. When I later that semester wrote my bachelor's degree dissertation, on the topic of health inequalities among Norwegian immigrants, I was lucky enough to get Professor Eikemo as my tutor. He introduced me to the interesting field of health-sociology. Since then his work on health inequalities has inspired me to investigate why some people are in better health than others at a much more detailed level. I would also like to thank Professor Håkon Leiulfsrud for introducing me to the theory of welfare regimes as an important piece of the puzzle in making sense of health inequalities among countries. I have been up to more than writing during the last year and sometimes it is easy to forget that there also exists a world outside of the reading room. I would like to thank my good friends John, Erik, Aleksander and Jomar for helping me to change my focus from my thesis to trivial things in the evenings. I thank my family for financial and emotional support during my five year long stay at the university. As a good storyteller, I saved the best for last. I want to thank my girlfriend Silje, for putting up with me, my late nights at the university and my lacking ability to focus on more than one task at the same time.

Abstract

Background
Social inequalities in health are persistent in society and remain one of the greatest challenges for public health. Europeans with lower socioeconomic status have shorter life expectancy and experience more health problems than people in the higher socioeconomic groups. Previous studies have revealed that the health impact of social health determinants may be comparable to smoking and other well-established risk factors. The main aim of this thesis is to provide estimates of the extent to which health inequalities in Europe realistically can be reduced by policies and interventions aimed at increasing the level of social capital among lower educational groups to the level seen among the highest educated.

Data and methods
For each population, social risk factor prevalence data from the early 2000s by gender, age and level of education were gathered from the first two rounds of the European Social Survey (2002 & 2004). Relative risks for the impact on mortality for the social risk factors was collected from a large meta-analytical review of 148 studies on social factors impact on health (Holt-Lundstad et al. 2010). Mortality data from a range of studies were available in the EURO-GBD-SE (2013) project data. The social risk factor prevalence data, the relative risks and the mortality data were combined in order to calculate Population Attributable Fractions (PAF) for mortality by population, level of education and gender, in order to simulate scenarios where educational differences in the social risk factors are completely eliminated.

Results
Different social risk factors were upward levelled so that all educational groups got the social risk factor prevalence currently seen in the highest educational group. The results vary from considerable reductions to no reduction at all in all-cause mortality depending on both the social risk factor, gender and country. Overall, living alone seems to be the social risk factor with least health potential, followed by marital status, while social isolation seemed to be the social risk factor with the greatest health potential. Social participation and perception of social support also seem to have a great potential for reducing educational inequalities in all-cause mortality in Europe, but there are important variations between countries.

Conclusion
The findings from this thesis show a substantial theoretical modifiability of educational inequalities in mortality by increasing the levels of social capital seen in the lower educational groups to the level currently seen among the highest educational groups through Europe. Educational inequalities in all-cause mortality could be substantially reduced and deaths could be avoided if policy makers succeed with policies aimed at eliminating differences in social risk factors in Europe. However, the magnitude of the reduction varies by social risk factor, country and gender. It is therefore important for the different nations to choose the most important entry-points in their population when forming policies.

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1. Introduction

1.1 Background

There are few things that are as important for individuals and society as a whole as health. Ill health and health problems pose a great burden to individuals and societies alike. The causes of good health are therefore of significant importance both from a scientific and a societal perspective. During the last decades there has been a non-diminishing search for the determinants of health. At first, the scientific interest was mainly in identifying the role of biological, genetic and technological factors influencing health. With the emergence of modern medicine, the discovery of bacteria as well as genetic and physical causes of morbidity and mortality, a strong bodily orientation arose in diagnostics and treatment. As a result of these medical discoveries the focus on other determinants of health seemed to be pushed into the background. This changed during the second half of the 20th century, when there was increasing evidence that other factors are also of significant importance in the explanation of health inequalities (Huijts 2011, Blaxter 2010, Halpern 2005). As a result of this the focus in the search for health determinants was turned toward economic, social, psychological and cultural factors. This represents a rediscovery and redirection of old sociological concerns about how interpersonal relationships affect health and well-being (House 1987).

Even now in the 21th century social inequalities in health remain one of the greatest challenges for public health. Even in the most affluent countries people who are less well-off have substantially shorter life expectancy than people in the higher socioeconomic groups (WHO 2003). Almost all causes of premature death are more common among people with lower levels of education, occupational class and income. The less well-off also tend to have higher prevalence of almost all kinds of health problems (Mackenbach 2006). Studies from different European countries have shown that health inequalities are substantial almost everywhere and exist between as well as within countries (EUROTHINE 2007, Mackenbach 2006). One of these is the EUROTHINE project (2007), which investigated health inequalities throughout the European Union in the 1990s. Results from the project showed that there are important variations between countries in the magnitude of health inequalities. These findings indicate that there is a great potential for reducing health inequalities both within the countries in Europe and between them. These differences in health are an important social injustice, and they are avoidable (CSDH 2008). Narrowing the health gap and making good health a reality for

everyone is of high importance to obtain social justice in the European Union (Mackenbach 2006). This suggests that neither genetic factors nor improvement in healthcare can account for the fact that some people are in better health than others. In fact, the findings from these studies have pointed toward a potential role of social factors as important determinants for people's health (Huijts 2011, WHO 2003). The quantity and quality of peoples social relationships has been proved to not only influence mental health, but also affect morbidity and mortality (Holt-Lundstad et al. 2010, Huijts 2011, Cohen 2004). The researcher Geoffrey Rose (1992) was of a similar opinion and stated that:

"The primary determinants of disease are mainly economical and social, and therefore it's remedies must also become social" (Rose 1992:129).

While the political scientist Robert Putnam (2000) stated:

"Of all domains in which I have traced the consequences of social capital, in none is the importance of social connectedness so well established as in the case of health and well-being." (Putnam 2000:326).

The recognition of the importance of social factors for health has resulted in an independent commission on social determinants on health, founded by the WHO, with a mission to link the existing knowledge with action (CSDH 2008, Marmot 2005). The European Union has also funded research programs aimed at investigating inequalities in health (EUROTHINE 2007, Mackenbach, Meerdinger & Kunst 2007, EURO-GBD-SE 2013). This thesis will particularly aim at investigating how inequalities in health in the European Union could be reduced if one succeeded with policies addressing social factors.

1.2 Social capital and health

Human beings are naturally social, and there is no doubt that the formal and informal social relations we participate in on a daily basis are of high importance for our functioning. If as individuals we take part in and maintain strong, trusting and persisting relations to others, we are better prepared for coping with many of life's challenges (Bø & Schiefloe 2007). The social

environment we take part in influences almost all of our life circumstances, and we function at our best as individuals when we are recognized as participants in meaningful social communities (Bø & Schiefloe 2007, Halpern 2005, WHO 2003). The importance of participating in and maintaining connections is therefore high, and the lack of social relations has been shown to make us more prone to depression, drug use, hostility, anxiety and feelings of hopelessness which rebound on physical health (WHO 2003). In fact the influence of social relationships on health has been shown to be comparable with other well-known risk factors for mortality, such as smoking, obesity and physical inactivity, but the link between social relationships and health is currently less well understood (Holt-Lundstad et al. 2010). The influence of social determinants on health is one of the most complex and challenging fields in the search for good health. It is not as simple as that poor material circumstances are harmful to health. The social meaning of being poor, unemployed or otherwise stigmatized also matters (WHO 2003, Wilkinson 2005).

Studies examining the correspondence between social relations and health started appearing in greater numbers during the 1970s, when a number of studies found a correspondence between lack of social networks and almost any cause of death. The early epidemiological studies explained this association with lacking social support as the explanatory mechanism. This explanation was later questioned when other factors such as social engagement, social influence and social attachment were also proved to affect health (Sund 2010). This has led research further, and in recent years public health researchers and health economists have applied increasing effort to documenting what appears to be a rather close link between social capital and health (Rocco & Suhrcke 2012). Connectedness is generated through social networks, and connectedness is what holds communities together and enables acts for common benefit (Putnam, Leonardo & Nanetti 1993, Blaxter 2010). In sociology understanding of this kind of connectedness, of our social networks and social relations, has been encapsuled in the concept Social capital. As a result, social health determinants and social capital have received increased attention in public health research, as explanatory factors for health inequalities in public health (Stephens 2007). The concept of social capital is in fact one of the most successful exports from sociology to public health (Sund 2010). By making use of insights from the social capital hypothesis we can get a better understanding of how our social relations influence health.

Based on findings from this research strand, policy proposals for decreasing health inequalities have been developed. In public health research social capital has been acknowledged as an

attractive explanatory model, as it combines the tradition of research on stress influence on health as well as the socio-biological link, which offers explanations for population health in an appealing way for policy makers (Blaxter 2010, Kritsotakis & Gamarniakow 2004). The importance of social capital for health has also received broad political attention. Social capital has become a popular term in the public debate, and policies aimed at increasing levels of social capital have been proposed as an option for decreasing health inequalities (Sund 2010, The World Bank 1998).

In today's society the ways we socialize are also changing. Current evidence from research on social relationships indicates that changing living patterns in industrial societies are resulting in a decrease in both the quantity and quality of social relationships (Putnam 2000, Holt-Lundstad et al. 2010). Dual career families, delayed marriage and increased numbers of single-residence households are becoming more common. Despite developments in technology and increased levels of globalization, which one could presume would simplify and foster social connectedness, people are in fact becoming more socially isolated in today's society. Taking these trends in living patterns into account the need for a better understanding of the relation between social capital and health is of increasing importance (Holt-Lundstad et al. 2010).

Broadly speaking the consensus from studies of social capital and health indicates that individuals with higher levels of social capital enjoy a longer, happier and healthier life than their counterparts lacking social capital (Huijts 2011). In line with Pearce & Smith's (2003) findings it seems like individuals with a high level of education tend to have a higher accumulation of social capital than the less educated (OECD 2010). There is some evidence that high levels of social capital in a community also may be beneficial for the disadvantaged groups. An American study conducted by Scheffler et al. (2008) showed that increasing social capital had greater effect on health among the most disadvantageous groups. Putnam et al. (1993) have suggested that social capital may "spill over" on individuals lacking social capital in resource rich environments. However, the literature is not consistent, and there are exceptions. A study conducted by Yoon (2008 as cited in OECD 2010:28) showed that the beneficial effect of social capital on health in aspects of lifestyle and diet was greater among the highly educated. That the existing literature contains different findings suggests that social capital influences health in several ways. A report made by the OECD (2010) also pointed out that degree of correspondence between educational attainment, social capital and health differs

greatly in the existing literature. Seen as a whole the literature points towards a multifactorial link between social capital and health (Sund 2010).

Two general theoretical models are suggested to explain how social capital and our social relationships may influence health (Holt-Lundstad et al. 2010). The first is a stress-buffering model, which suggests that people's social relationships and social capital contains and provide resources that may promote adaptive behavior as well as neuroendocrine responses to stressors such as dramatic life events, life transitions and illness, but also to smaller challenges in everyday life (Cohen 2004). The resources in the social relationships through perceived social support from others work as a buffer and thereby moderate the influence of stressors on health (Holt-Lundstad et al. 2010, Cohen 2004, Cohen & Wills 1985). The other is a direct-effect model, sometimes called the main effect model. This model suggests that a person's social capital and relations are associated with health through more direct means in the form of behavioral, cognitive and emotional influences that are not necessarily intended as support. This suggests that social relationships influence health directly, but also indirectly through social norms, for example relevant to health and self-care expected of members of the network. Being part of a network also gives the individual meaningful roles which provide self-esteem and purpose in life (Holt-Lundstad et al. 2010, Cohen 2004, Halpern 2005, Cohen & Wills 1985).

Even though different mechanisms and explanatory pathways between social factors and health are suggested in the literature, realistic measures of reducing health inequalities based on social health determinants are scarce (Pichler & Wallace 2008, Hoffman et al. 2012). It is currently unknown to what extent they are modifiable (EURO-GDB-SE 2013, Hoffmann et al. 2012). There is a pressing need for knowledge of which characteristics of the social environment is beneficial for health (Cohen 2004, OECD 2010). This limitation hampers the development of effective policy making, because it hinders priority setting and quantitative realistic public health goals (Hoffmann et al. 2012). This thesis has therefore set out to quantify the potential for reducing health inequalities in mortality by addressing a number of key social determinants.

In the existing literature social capital has been treated in a variety of ways, and no shared definition has yet been developed. Despite major differences two main components of social capital are evaluated. The structural component considers the degree of integration in social networks, while the functional component concerns social interaction that is meant to be supportive and the perception of available support which the individual experiences (Holt-

Lundstad et al. 2010, Cohen 2004, Song 2009). This distinction may also be referred to as cognitive and structural social capital (Eriksson 2011). These two sub-constructs of social capital have been shown to be only moderately inter-correlated. Both have been shown to influence health, and it is suggested that they may influence health in different ways (Holt-Lundstad et al. 2010, Cohen 2004). In this thesis functional social capital will be examined through the determinant of received available social support, and structural social capital will be addressed through the social capital indicators of marital status, social isolation, social participation and living alone. These indicators has been shown to influence health in the literature (Halpern 2005, Huijts 2011, OECD 2010, Putnam 2000, Bø & Schiefloe 2007). The indicators of social capital will be examined as possible risk factors on health. Studies of social capital and health have been criticized in the existing literature for often measuring social capital in terms of formal organizations (Huijts 2011). By addressing different determinants of social capital that also include informal relations, the thesis will also seek to answer this critique. This is important because there is no doubt that family networks as well as other informal social ties also provide person to person contact that may influence people's health (Huijts 2011).

1.3 Problem of interest

The issue of obtaining realistic measures for reducing health inequalities is addressed through an estimation of a counterfactual scenario for the European countries; Norway, Sweden, Finland, Denmark, England and Wales, Scotland, the Netherlands, France, Belgium, Switzerland, Austria, Spain, Italy, Hungary, the Czech Republic, Estonia and Poland. The counterfactual scenario expresses what would happen to health inequalities if we succeed in eliminating educational inequalities in exposure to the addressed social risk factors. The counterfactual scenario used in this thesis is an upward levelling scenario, it simulates that all educational groups get the exposure to the social risk factors (perception of social support, marital status, social participation, living alone and social isolation) at the level currently seen among the highest educational groups within each of the European countries under study. The European countries under study will also be treated as five European regions; North, Western, South, Eastern and British. In order to study European region differences. The outcomes from the scenario therefore show the reduction of educational inequalities in mortality that would be obtained if a number of European populations succeed in eliminating educational inequalities in social health determinants through policy interventions. Until recently, methods to quantify the impact of changing risk factor distributions have not been applied to social risk factors

(Hoffman et al. 2012). In this thesis, this will be dealt with through the linking of social risk factors to the health outcome all-cause mortality through population attributable fractions (PAF). The thesis will therefore contribute to filling important gaps with regard to the impact of social capital on health inequalities.

Education has been chosen as an indicator of socioeconomic position. In the literature, socioeconomic position is usually measured by determining education, income, occupation or a composite of these three dimensions. Here education is used as an indicator for socioeconomic position, since it is possible to argue that education as a variable also structures the other two. Education is the key to one's position in the social stratification system, and sorts individuals into different positions that are associated with different levels of risks and rewards, as it determines the likelihood for being unemployed, level of income, the kind of job one can get etc. (Ross & Wu 1995). There are several advantages associated with using education as an indicator for socioeconomic status. Educational status is available regardless of employment status and is generally stable after early adulthood, which avoids reverse causality problems (i.e., health problems at older ages cannot change a person's level of education) (Daly, Duncan, McDonough and Williams 2002, Winkleby, Jatulis, Frank & Fortmann 1992). Over time education has also become the most commonly used measure of socioeconomic position in epidemiological studies (Winkleby et al. 1992).

This thesis will use insights from the social capital hypothesis to explain the pathways through which the social health determinants influence health. The insights from the social capital hypothesis will be linked to the estimations for potential reduction in mortality in order to explain their health impact. The estimations are obtained by eliminating educational differences in the exposure to the addressed social risk factors and provide realistic estimates for reductions in mortality in 16 European countries. *The main problem of interest in this thesis is to examine the role of social capital in understanding and reducing educational health inequalities*. This may provide guidance on priorities for health policy in different European countries.

In the following there will be a section on previous research on health inequalities in Europe and why it is relevant to study health inequalities in relation to social factors and social capital. The previous research chapter will be followed by an introduction to the concept of social capital from the social sciences including social capitals status in the literature today, and a theoretical backdrop to the concept by an examination of the works of James Coleman and

Robert Putnam. The theory chapter will also include an examination of social capital's link with health and health inequalities from health sociology and epidemiology, to get a notion of how our social relations influence our health. The data and methods chapter will provide information on the data used in the thesis, as well as information about the analysis. The result chapter includes the estimations of the impact of social capital on health for the educational groups in the European nations and regions. In the discussion chapter, the results from the analysis is discussed in connection to the previous research and theory on social capital, in order to explain the main findings. The discussion also discusses strengths and limitations with the thesis and the chosen approach as well as suggestions for further research. A brief summary of the main findings and their implications is discussed in the conclusion.

2. Previous research

2.1 Social inequalities in health. What is the evidence?

This thesis will examine the role social capital plays for educational inequalities in health, both between and within European countries. This makes it important to clarify what is meant by health inequalities and how social inequalities in health differ from other types of differences in health. Health may be considered as an individual level phenomenon, this notion is reinforced by the medical system, as medical treatment is focused on the individual (Payne, Payne & Bond 2006). Some health differences between groups in society are biological facts rather than health inequalities, i.e. poor health among the older part of the population compared to the young part. Yet, there are large and systematic differences in health between socioeconomic groups in all societies that may be considered unequal (Rostila 2013, Payne et al. 2006). The systematic differences in health between socioeconomic groups in society indicate that the social structures play an important role in health inequalities (Rostila 2013). Health differences between socioeconomic groups are thought to arise through systematic differences in health behaviors, living conditions and vulnerability to disease, which then in turn result in health inequalities between the socioeconomic groups. Therefore, poor health is not an individual problem alone, but also a societal problem (Rostila 2013, CSDH 2008).

Despite well-developed health care systems, sufficient living standards and advanced medical technology there still exist social inequalities in health in Europe (Rostila 2013, OECD 2010, WHO 2013). The Social inequalities in health are widely documented in the Western societies (WHO 2003, WHO 2013, Marmot 2005, Mackenbach 2006, Rostila 2013, OECD 2010, EUROTHINE 2007, Rose 2000). The British Black Report was the first to acknowledge the unequal distribution of health between social groups in the early 1980s (Townsend and Davidson, 1982). Due to improvements in living standards and public health in the last decades the absolute socioeconomic health inequalities have declined across Europe, but social inequalities in health are still one of the major challenges to public health in the 21st century (Mackenbach 2006, WHO 2003, WHO 2013). In general, people with higher socioeconomic status are in better health than people in the lower socioeconomic groups. The inequalities start already in early life and persist into old ages. Inequalities in health and mortality are found for almost all the specific death causes among different socioeconomic groups (Mackenbach 2006). There are numerous examples of studies that have concluded that a lower socioeconomic position is bad for your health, both in the USA (Murray 2006, Krieger et al. 2005) and in

Europe (EURO-GDB-SE 2013, Marmot 2005, Huisman et al. 2012, Mackenbach 2006, Mackenbach et al. 2007, Mackenbach et al. 2008, OECD 2010, EUROTHINE 2007). The health inequalities are persistent and found for all kinds of indicators for socioeconomic position. People with lower levels of education, (Silvertoinen & Lahelma 2002, Kravdal 2014, Mackenbach et al. 2008) income (Veenstra 2002, Subramanian & Kawachi 2003) and occupational class (Mackenbach 2006, Mackenbach et al. 2008) consistently have higher rates of mortality than the higher socioeconomic groups. It seems like there is a gradient in health that runs from top to bottom according to the individual's socioeconomic position. The health gradient is present not just between countries, but also within them. It seems that for each step down the social ladder, people's health become worse. The commission on social determinants of health concluded that the health inequalities are largely due to differences in people's living conditions and life chances (CSDH 2008).

The socioeconomic inequalities in health have persisted over time and are a common theme in all European countries, but in the last decades of the 20th century they seemed to be increasing in several European countries (Kunst, Groenhof & Mackenbach 1998, Mackenbach 2006, Rostila 2013). This trend is not unique for Europe; in Russia relative health inequalities have also been proved to be increasing (Marmot 2005). The increase in relative health inequalities particularly seems to affect the Western countries with high levels of prosperity, social security and high quality healthcare systems. This trend is both unexpected and disturbing. The growing inequalities have contributed to higher awareness of the challenge which health inequalities pose to public health. The reasons for the increasing health inequalities are also currently unknown, but Mackenbach (2006) has suggested that a widening of relative socioeconomic health inequalities may be a result of differences in the speed with which mortality decreases. Improvements in health related behavior and more effective health care have to some degree been taken up in all socioeconomic groups. Still, it seems like the higher socioeconomic groups benefit most from these interventions and changed living patterns (Mackenbach 2006). To be able to tackle this negative development a deeper more detailed understanding of the underlying causal mechanisms causing the social health inequalities is of high importance.

2.1.1 Social inequalities in health in Europe

Inequalities in health are found everywhere in Europe, but there are large differences between countries in how far they have come in the mapping of health inequalities. The EUROTHINE project (2007) examined health differences in 22 European countries with the health outcomes

self-assessed health and mortality. Results from the project showed that rates for mortality and poor self-assessed health were almost without exception substantially higher in the lower socioeconomic groups. The project also showed great differences in the magnitude of health inequalities among countries, suggesting that socioeconomic inequalities in health may be a greater challenge to public health in some European countries. The smallest health inequalities were found in the Southern European countries, while the largest were found in the Eastern European countries. The Eastern European countries had inequalities of a much larger size than the European average. Though high levels of welfare and egalitarianism distinguish the Northern European countries, they were also shown to have substantial socioeconomic inequalities in health (EUROTHINE 2007). The Norwegian health minestery has previously shown similar results in Norway (Gradientutfordringen 2005). The magnitude in the health inequalities in Europe is to some degree expected according to different countries' political, cultural, economic and epidemiological histories (EUROTHINE 2007). That health inequalities vary among countries in Europe may impose limits to the exchange of research findings and experience transfer within health policies among the countries, since they are all in different situations (Kunst et al. 1998).

The health inequalities affect both genders, but tend to be greater among men (EURO-GBD-SE 2013, Mackenbach 2006). Mackenbach (2006) explains the health inequalities between the genders as partly a result of differences in cause-of-death patterns. Women die of cancer more often than men do, and inequalities in cancer mortality seems to be smaller than for mortality induced by other causes of death. Based on the evidence from these studies it seems that socioeconomic inequalities among men are a more urgent public health problem than socioeconomic inequalities among women; still, they are both of high importance to policy makers (Mackenbach 2006, Judge, Platt, Costongs & Jurcak 2006).

As we have seen, socioeconomic health inequalities are widely documented, but the underlying mechanisms causing the health inequalities are yet to be fully understood. The health inequalities are thought to be the result of a multifaceted number of reasons (EURO-GDB-SE 2013, Mackenbach 2006, Mackenbach et al. 2007, Rostila 2013, Gradientutfordringen 2005, Rose 2000). The health effects of obtaining a high socioeconomic position exceeds what we could expect from the higher levels of income alone, and are often explained with differences in exposure to risk factors to health such as health behavior, diet, smoking, exercise, social relations, area of residence etc. The exposure to risk factors to health is more concentrated

among the lower socioeconomic groups and this influences the health of the citizens unequally, resulting in social health inequalities (OECD 2010). These unfavorable risk factors can be material, behavioral and psychosocial (Mackenbach 2006). There exists empirical evidence showing that exposure to the social health determinants is unequally distributed for almost all European countries (Judge et al. 2006). This strongly suggests that socioeconomic inequalities in health can be reduced by improving the life situations among individuals in the lower socioeconomic groups (Mackenbach et al. 2007).

The overexposure to risk factors for health leads to huge differences in life expectancy between socioeconomic groups in the European nations (Mackenbach et al. 2007). Inequalities in life expectancy in Europe are typically 5 years or more, but the higher socioeconomic groups also spend a larger portion of their life in good health (EURO-GBD-SE 2013, EUROTHINE 2007). Similarly to inequalities in mortality, rates of morbidity are usually higher among people with low occupational, educational and income levels. Socioeconomic inequalities are documented for several health outcomes, such as self-assessed health, chronic conditions, mental health problems, functional problems and disabilities (Mackenbach 2006). The health inequalities result in a difference in healthy life expectancy of 10 years or more between the highest and the lowest socioeconomic groups (EURO-GBD-SE 2013, EUROTHINE 2007). The social inequalities in health therefore pose a double burden to the lower socioeconomic groups, as they do not only live shorter lives, but also spend a larger number of them in ill health (Mackenbach 2006).

2.1.2 Why should we focus on social capital in reducing health inequalities?

In general, the literature agrees that social inequalities in health are one of the greatest challenges in making good health a reality for everyone. People tend to report better health and have lower risks for mental illness, morbidity and mortality if they have obtained a higher socioeconomic position and live in more favorable neighborhoods (Huijts 2011, OECD 2010, Rose 2000, Mackenbach 2006, CSDH 2008). The mechanisms and pathways through which socioeconomic position influence health are, however, less well understood and are thought to be the result of a number of reasons. This thesis aims at examining how social capital influences socioeconomic inequalities in health. The social health determinants provide crucial knowledge of why health differs between countries and between social groups within countries, but research on the role of social capital in explaining socioeconomic health inequalities is still scarce (Rostila 2013, Pichler & Wallace 2008). By providing information on how social capital

contributes to health inequalities we will be able to understand socioeconomic health inequalities at a more detailed level. This allows examination to move beyond illustrating the importance of psychosocial factors for health to a more in-depth study of the specific social risk factors involved, and to suggest what social factors public health should target. In turn, more accurate health policies for improving social capital among the disadvantaged may contribute to reducing health inequalities and better population health. To be able to link social capital with socioeconomic health inequalities it is important to have background knowledge of how social capital is conceptualized in sociology and health research.

3. Theory

3.1 Social capital

The scientific interest in the concept of social capital has been increasing in the last decades and different sciences as well as political environments have embraced the concept. Today the concept of social capital is actively used in economics, educational research, political economy, political science, and public health research (Sund 2010, Song 2009, Halpern 2005). They all have in common that they have adopted and further developed the concept in their own field. In the literature social capital is alleged to have positive effects on the development of democracy, crime, well-being, life satisfaction, health and economic development to mention some areas of life (Stephens 2007, Halpern 2005, Song 2009, Putnam 2000, Sund 2010). This thesis takes a multidisciplinary perspective on social capital, health and health inequalities, since it makes use of the conceptual development of social capital from sociology and theories on how social capital is related to health and health inequalities from public health and epidemiology. The examination of social capital will be limited to social capital's link with health and health inequalities.

The extensive use and high popularity of the concept have resulted in quite a large, rapidly growing number of publications in the field of social capital. As is often the case with new concepts in the social sciences, the rapidly growing amount of literature has led to increasingly controversial conceptualizations, unclear measurements, contestable operationalization and broad applications of the concept (Song 2009). To this day, there is no broadly acknowledged definition of social capital. This is problematic as it makes the concept appear diffuse and unclear in the literature. The wide ranges of definitions that exist and are in simultaneous use in the literature have resulted in an inflation of the concept (Cohen 2004). Without going further into the debate on defining social capital, which has been much discussed elsewhere, social capital will be used in this thesis as an umbrella term for social processes related to social connectedness on different levels of aggregation, ranging from individuals to societies[1].

Social capital is distinguished from the other capital forms in the social sciences due to its relational anchoring (Coleman 1990). Economic capital is a concrete phenomenon, in the form

[1] For a discussion of the problematic on defining social capital see: Carpiano, R., M., (2006) Toward a neighbourhood resource-based theory of social capital for health: can Bourdieu and sociology help? Soc Sci Med. 62(1): 165-75. Or: Portes, A. (1998) Social Capital: Its Origins and Applications in Modern Sociology. Annu Rev Sociol 24: 1-24.

of money, stocks, buildings, machinery etc., while human and cultural capital is embodied inside the individual and constituted by the individual's knowledge, skills and cultural competence. Social capital, however, is neither to be seen as a concrete phenomenon or as embodied in the individual. Social capital stands out as an interpersonal phenomenon constituted by the relations linking individuals together (Halpern 2005, Bø & Schiefloe 2007, Coleman 1990). This distinction from the other capital forms puts social capital in a unique position in understanding how our connections to others influence our health and functioning (Sund 2010).

Despite different definitions and ways of understanding social capital in the existing literature the previous research seems to be grasping a mutual core, that social relations contain resources. These resources have been claimed to affect individuals, communities and society as a whole. Even though the existing literature assumes some of the same contents, there are important differences in the understanding of how social capital arises, transfers and enables actions between individuals and whether social capital is a universal asset or an excluding resource (Halpern 2005, Song 2009, Bø & Schiefloe 2007, Sund 2010).

The idea that societal features may have health consequences goes all the way back to Durkheim's ([1897] 1997) seminal work on suicide. Durkheim argued that aspects of social capital can vary systematically between countries and that differences in social integration can explain country level suicide rates. Yet, it was the introduction of the concept of social capital by sociologists such as Bourdieu, Coleman and the political scientist Putnam that contributed to the increased interest for social capital in health sciences (Rostila 2013, Song 2009). In the following the theories of social capital of James Coleman and Robert Putnam will be introduced to provide a theoretical backdrop to the concept of social capital in the social sciences. These theories are some of the most established theoretical contributions to the concept social capital in the social sciences.

There are several similarities between Coleman's and Putnam's theories. The common denominator between them is that networks, obligations and relations contribute resources that constitute the fundament of social capital. Song (2009) argues that Coleman and Putnam represent a normative approach to social capital, in the sense that both of them underline moral norms such as trust and reciprocity as forms of social capital. They both emphasize the benefits of social capital from a functionalist perspective. The functionalist perspective assume that

society is held together by social consensus, that the members of society agree on and work together to achieve what is best for society as a whole (Song 2009). We will start with James Coleman, who understood social capital as an individual level asset, before we move on to Putnam's collective approach to social capital. Whether social capital is an individual or collective level feature is to this date still debated (Eriksson 2011). Despite the controversies, social capital will be regarded as a concept including both individual and collective features in this thesis, since it seems plausible that an individual's health could be affected both by the individual's own personal social capital, and the social capital characteristics in their surroundings (Rostila 2013). The works of Coleman and Putnam have served as inspiration and framework for following research and theorizing on social capital, but others could have been included.

3.1.1. Social capital as a resource for action

It was Coleman's examination of social capital in the article "Social capital and its role in the creation of human capital" that called multidisciplinary attention to social capital (Song 2009). In *Foundations of Social Theory* Coleman (1990) developed his framework from this article further. Here Coleman understood social capital as anchored in the social structure, tied to the relations that occur and exist between people participating in larger social structures at the meso and macro level. Social interdependence and systemic functioning arise from the interest of individuals in events that are under the control of other actors. Individuals seek to attain their interest by forming social relationships that persist over time and enter into these kind of relations on the background of authority relations, relations of trust and consensual allocation of rights (Coleman 1990). Coleman (1990) thought that belonging and participating in social relations and networks provide individuals with access to resources that would be unavailable in the absence of these networks. This illustrates an important point in Coleman's understanding of social capital: that the social relations and networks we participate in function as a resource for action. However, Coleman also emphasize the positive functions and returns of social capital at the collective level (Song 2009). Coleman (1990) defined social capital as a phenomenon with several qualities:

"It is not a single entity, but a variety of entities, with two elements in common: they all consist of some aspect of social structure, and they facilitate certain actions of actors- whether persons or corporate actors – within the structure. Like other forms of capital, social capital is productive, making possible the achievement of certain ends that in its absence would not be possible" (Coleman 1990:98).

In his theory, Coleman criticizes the fiction of independent individuals that achieve their goals entirely independently of other actors (Halpern 2005). Goals are not independently achieved and an individual's goals are not wholly selfish. In his understanding of goal achievement Coleman supports Granovetter's (1973) notion of "the under-socialized concept of man". For instance, the classical economic theories often explain the existence of economic institutions merely by the function they perform for the economic system. Coleman argues that these kinds of explanations fail to recognize the importance of concrete personal relations through networks and their function in generating trust as well as establishing expectations and creating and maintaining norms (Coleman 1990). It is essential in Coleman's theory that the outcome of social capital is the achievement of goals that could not be achieved in its absence or that the outcome could only be achieved at a higher cost. Social capital is therefore created when relations among actors change in ways that facilitate action that allow individuals to achieve their interest (Coleman 1990).

In the article "Social capital in the Creation of Human capital*"*, Coleman (1988) presents three forms of social capital. The first form is social capital as obligations and expectations among actors. Obligations are of central importance for understanding social capital. The obligations tie individuals to each other through the feeling that they owe each other something. If I do something for you, I expect getting a favour back in the future. An expectation is established. This relationship is not always balanced between the participants. In some social networks, for example between family members, the extent of exchange and what we are willing to do is almost unlimited, this is certainly not the case with colleagues. According to Coleman, an important reason for the willingness of individuals to take part in these kinds of obligating relations is the informal structure around us with reliable relations between the actors involved in the transaction, where individuals with high levels of outstanding obligations have greater social capital than other actors (Coleman 1988). In practice, it will often be the case that all actors have some capital credited, of different kinds, and these are not mutually excluding (Coleman 1988, Halpern 2005).

The second type of capital is the information channels which the social networks provide. According to Coleman (1988) information channels are important because they function as the basis for action. The individual's relations to others offer information about current affairs from

friends, colleagues or acquaintances, that may facilitate action and lower transaction costs. The third form of social capital is through norms and sanctions. Existing and effective norms may have a preventive effect on antisocial behavior. For instance, the sanctions on criminal activity make the society a safer place to live in. In some cases, the norms are internalized, in other cases they can be effectuated through rewarding or sanctioning behavior from others. Social capital in the form of norms therefore not only promotes certain types of behavior, but also prevents negative types of behavior through social control and peer pressure. This may in some cases be beneficial for the individuals, but at the same time fear of sanctions may hamper the freedom of the individual (Coleman 1988).

3.1.2 Robert Putnam: Social capital as a collective asset

Approaches that understand social capital as a collective asset almost exclusively have their theoretical basis in Robert Putnam's writings, and Putnam's work is considered as some of the most influential in the field of social capital[2] (Eriksson 2011). Putnam was influenced by Coleman's theoretical framework and also credited him for it (Blaxter 2010). One important distinction between Coleman and Putnam exists in their causal arguments with regard to social networks. While Coleman used networks as a source of social capital Putnam subsumed networks under social capital (Song 2009). In *Making Democracy Work*, Putnam, Leonardi and Nanetti (1993) used the concept of social capital to describe and explain the efficiency of the Italian government. Here Putnam defined social capital as:

"features of social organization, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions." (Putnam et al. 1993:167)

Putnam noted that the decentralization reform in Italy during the late 1970s was more efficient in some regions than others. According to Putnam this was a result of inequalities in civil society. In regions with higher levels of civic engagement, embedded in local organizations and networks, decentralization worked better than in regions with low social engagement (Putnam et al. 1993). Putnam explained this by introducing social capital as a phenomenon that makes societies work better through the facilitation of coordinated actions between individuals in

[2] The World Bank (1998) have adopted a definition of social capital inspired by Putnam. *"Social capital is not just the sum of the institutions which underpin a society – it is the glue that holds them together."*

society. Putnam claimed that social capital is created through citizens' participation in organizations and groups, and this participation also leads to the development of trust between members of society (Rostila 2013).

Later, in his work *Bowling Alone,* Putnam continued to study social capital in an American context. Here Putnam (2000) points out that despite modernization and "shrinking" of the world due to technological development, levels of social capital have decreased in a variety of fields in American society during the last decades of the post war era. Putnam illustrated this by pointing to decreased election participation, lower numbers who choose to take part in voluntary organizations, diminishing solidarity at the workplace and lower levels of trust towards others. Putnam understood this as a negative development, since high levels of social capital simplify community life and social networks are one of the most important contributors to this simplification through the development of trust and reciprocal norms (Putnam 2000, Blaxter 2010). Putnam expected this trend of decreasing social capital to be found also in other western societies (Rostila 2013). Putnam (2000) argued that increased levels of television watching, increased female labor market participation, the middle-class movement to suburbs and a new generation of less "civic" individuals were the most important factors underlying the decline of social capital.

Putnam's handling of social capital could be seen as a description of the social relations of both familiar and non-familiar people (Halpern 2005). Putnam (2000) makes a distinction between formal and informal connections in his theory. Formal social connections include participation and membership in formal organizations and activities such as educational, political, religious, recreational and professional activities. Informal social connections on the other hand refer to participation in family life, with friends and in the neighborhood in informal social and leisure activities (Putnam 2000). Putnam assumes that network participation increases the productivity of the individuals and reinforces norms of reciprocity. Reciprocity involves that individuals carry out actions without expecting anything specific back, because they have a confident expectation that others will play by the rules and do the same. The expectation of honesty and social trust lubricates social life, and the norm of reciprocity works as a community asset that increases efficiency in society (Putnam 2000, Song 2009).

3.1.3 Social capital as bonding and bridging

Putnam (2000) further distinguishes two subtypes of social capital: bonding and bridging. The structure of networks can to varying degrees appear as open or closed in relation to the surrounding world. Putnam thought that different forms of networks promote different forms of social capital. Bonding networks are characterized by linking homogenous actors closely together. Putnam (2000) noted that close connections within groups seemed to have beneficial consequences. This kind of connections gives the actors a notion of belonging and confirms identity. These types of networks occur among family, friends and other groups where a function of the group is to exclude other actors in society (Putnam 2000). Bonding relationships act as the primary means for the transmission of behavioral norms to friends and family members. Bonding social capital plays an important role in the establishment of healthy norms, controlling abnormal social behavior and for generating mutual aid (Islam, Merlo, Kawachi, Lindstöm & Gerdtham 2006). The sense of community in the group is high and the threshold for accepting new members is correspondingly high. According to Putnam, networks the of bonding type are recognized by thick trust built in to strong personal relations. Social capital from bonding networks is easily mobilized and offers the individuals support and aid in situations where it is required (Putnam 2000).

In contrast to bonding networks, bridging networks are more open and outwardly directed, but they also have weaker structures. According to Putnam (2000) these kinds of networks are recognized by thin trust. Thin trust refers to a general trust in people with whom one is not necessarily familiar. These kinds of networks grant people access to other social or professional environments and enable interaction between different groups. Networks of this type can originate in education, work or participation in volunteer organizations and link more heterogeneous actors together. They have in common that they are relatively open for inclusion of new members. This type of social capital is particularly useful when it comes to obtaining information and in finding opportunities for innovation (Putnam 2000). In Putnam's theory it is through bridging networks that one can "get ahead" in life. In his notion of the importance of bridging networks, he is clearly inspired by Granovetter's (1973) "Strength of weak ties". Bridging social capital is therefore important for the success of the civil society and it is recognized as an important source of benefits for individuals, communities and society. Bridging social capital may be associated with better health because it enables disadvantaged groups to access resources through their connections with socially advantaged groups (Islam et al. 2006).

The distinction between bonding and bridging networks is in no way absolute: networks appear more or less open or closed to their surroundings as social relationships have a changeable and complex character (Halpern 2005). This changeable character is often neglected in health research. In reality it is more of a continuous dimension, for instance it is likely that bridging social ties in some situations change into bonding social ties over time. A person might have a formal relationship with his boss during working hours, but after working hours their relationship might turn into a more informal relationship when they meet as close friends (Rostila 2013). In both the professional and private sphere both types of networks can be useful. Putnam sees bonding networks as a sociological superglue for their members, while the open, outreaching bridging networks can be seen as a sociological lubricant (Halpern 2005). By recognizing positive functions of social capital at both the individual and the collective level Putnam (2000) illustrates that social capital is both a private and a public good. With this background understanding of the concept of social capital from the social sciences, we will now move on to examine how social capital is related to health and health inequalities.

3.2 Social capital and health

Since ancient times it has been believed that interpersonal circumstances affect our behavior, mood and morbidity (Bø & Schifloe 2007). The high importance of social relationships for human health and well-being is widely documented and no longer a topic of medical discussion (Halpern 2005). Since the rediscovery of social health determinants in the 1950s there has been an increasing interest in social-medicine, psychology and the social sciences in the influence of social capital on health. This rediscovery contributed to a renewed understanding of the multifaceted and complex nature of health and its relation with social factors (Blaxter 2010, Huijts 2011, Halpern 2005). This line of research focusing on social factors and health has to a large degree been drawing upon Putnam's (2000) theoretical framework. In his early works Putnam (Putnam et al. 1993) disfavoured explanations of health outcomes with social capital. Putnam later changed his mind about the role of social capital in explaining health differences (Halpern 2005). This is stated clearly in *Bowling Alone* as we recall from the introduction:

"Of all the domains in which I have traced the consequences of social capital, in none is the importance of social connectedness so well established as in the case of health and well-being." (Putnam 2000:326).

Putnam goes even further when he sums up the influence of social capital on health:

"The bottom line from this multitude of studies: As a rough rule of thumb, if you belong to no groups but decide to join one you can cut your risk of dying over the next year in half. If you smoke and belong to no groups, it's a toss-up statistically whether you should stop smoking or start joining. These findings are in some ways heartening: it's easier to join a group than to lose weight, exercise regularly, or quit smoking." (Putnam 2000:331).

These statements illustrate Putnam's belief in the potential effects of social capital on health. In a review of existing literature on the link between social capital and health More, Haines, Hawe and Shiell (2006) conclude that Putnam's conceptualization is the most widely used[3]. This notion is supported by another literature review conducted by Carpiano (2006), who concludes that studies on social capital and health almost exclusively build on Putnam's theoretical framework.

3.2.1 Sub-constructs of social capital in health research

Putnam's formulation of the social capital concept has been further developed into two sub-constructs: functional social capital and structural social capital (Song 2009, Holt-Lundstad et al. 2010, Eriksson 2011). Cohen (2004) has stated that it is only by understanding the different dimensions of social capital that one can target social relations with interventions. It is the understanding that different social variables influence health through different and independent mechanisms that has resulted in the identification of the two sub-constructs of social capital (Holt-Lundstad et at. 2010, Cohen 2004, Song 2009 Eriksson 2011). Much of the literature shares the notion of the two sub-constructs, and they have been shown to be only moderately inter-correlated. The functional form of social capital contains actual received social support and the perception of social support which the individual experiences as available. It involves trust and norms of reciprocity and refers to social cohesion holding networks together (Song 2009, Cohen 2004, Uphoff, Pickett, Cabieses, Small & Wright 2013, Holt-Lundstad et al. 2010).

[3] For more information on the conceptualization of social capital in relation to health see: Moore, S., Haines, V., Hawe, P., & Shiell, A. (2006). "Lost in translation: A genealogy of the "social capital" concept in public health." Journal of Epidemiology and Community Health, 69(8): 729-734.

The second sub-construct of social capital is a structural component and includes formal and informal social connections (Song 2009). Structural social capital involves social integration and facilitates sharing of knowledge and collective action (Cohen 2004, Uphoff et al. 2013). The concept of social integration goes all the way back to Durkheim's ([1897] 1997) work on suicide in the social sciences. The main line in Durkheim's work is that stable structures and norms in society serve a protective function and regulate the citizens' behaviour. Structural social capital is thought to include both a cognitive and a behavioral component. The behavioral component includes active engagement required and made possible by the social organizations, activities and relationships one takes part in. The cognitive component provides a sense of communality and identification with the social roles individuals possess and contributes to identity development and feelings of belonging (Cohen 2004). The functional and structural components of social capital are thought to contain the most important resources of social capital in relation to health (Song 2009, Holt-Lundstad et al. 2010).

3.2.2 Social capital as a health determinant

Health determinants can be divided into downstream and upstream determinants of health. In this notion downstream determinants are located closely to the individual level, while upstream determinants are located at higher levels in the structure of society (Rostila 2013). Since we consider social capital as a multidimensional concept that is present both at the individual and the collective level we could consider social capital as both a downstream and an upstream social determinant of health. The individual effect of social capital as a downstream determinant for health includes the individual attributes and activities related to social capital, which in turn may influence health. However, social capital may also work as an upstream social determinant of health and influence or be influenced by the social environment in a society, area or neighborhood. Social capital can then influence health indirectly in the form of a collective effect of social capital on health (Rostila 2013). However, the amount of available research documenting contextual and national effects of social capital is much smaller than for the individual level (Halpern 2005, Pearce & Smith 2003). It is suggested that collective social capital may work over and above individual social capital, this makes it important to separate the collective aspects from the individual aspects (Rostila 2013, Huijts 2011, Halpern 2005). In order to keep this distinction as clear as possible different mechanisms that link social capital and health at the individual and contextual level will be presented separately.

3.2.3 Individual social capital and health

How could our social relations affect the biology of human beings in ways that manifest themselves in good health, morbidity and even mortality? It is relevant to question how factors such as social support, stable norms, active engagement in organizations and sense of belonging influence our health. Individual social capital in the form of social relations and the resources embedded in them as determinants of health have been suggested to influence health in a wide number of ways in the literature (Rostila 2013). The empirical evidence for the influence of social capital on health on the individual level is overwhelming and social capital has been shown to influence physical health, mental health, well-being and life satisfaction (Whitley & McKenzie 2005, Halpern 2005, Islam et al. 2006). The biological and causal mechanisms behind the influence are, however, still not fully understood (Cohen 2004, Rocco & Shurcke 2012). Studies have shown that it is not only the quantity of social relationships that affect health, the quality of the relationships one take part in also matters (Huijts 2011, Cohen 2004). Generally, individuals with good and persistent social ties with correspondingly high social capital feel healthier both physically and mentally and express less risky health behavior in comparison with their less well-off counterparts (Huijts 2011, Halper 2005). Two theoretical models have achieved widespread acceptance in the explanation of how social capital influences health: the stress-buffering model and the direct effect model (Cohen 2004, Holt-Lundstad et al. 2010).

3.2.4 The Stress-buffering model

It has been suggested that qualities in a person's social life influence the immune system and the organisms capacity for restitution through a socio-biological link (Halpern 2005). The stress-buffering model builds on this assumption and the model assumes that social resources indirectly influences health (Cohen & Wills 1985, Cohen 2004). The stress-buffering model seeks to explain how our bodies answer to stress and how social capital affects how individuals cope with stressors. The line of reasoning is that accumulated social capital could work as a shock absorber that helps reduce the impact of stressors when they occur (Cohen & Wills 1985, Halpern 2005).

The stress-buffering model presumes that our social connections are beneficial to health by providing psychological and material resources that help individuals cope with stress. The model therefore presumes that social support is most beneficial for individuals who experience adversity, the buffer of resources does not affect people without stressful demands (Rostila

2013, Cohen 2004). Stress is thought to influence health in a number of ways. Stressors are for example known to trigger behavioral cooping responses that are related to ill health such as smoking, sleep loss, alcohol consumption, illicit drug use and bouts of overeating (Cohen 2004). Stressors do also activate physical systems such as the sympatic-nervous system and put the body in the fight-or-flight reflex. This may be beneficial for shorter periods of time, but prolonged or repeated activation of the flight-or-fight reflex due to constant exposure to stressors consumes the buffer. This leaves the body in a state highly susceptible to disease, because it results in neglecting the routine of bodily maintenance (Cohen & Wills 1985). This is thought to have a range of negative influences on health and is linked to a range of physical and mental disorders (Cohen 2004).

The literature on the stress-buffer model suggests that it is mainly the sub-construct functional social capital that operates as a stress buffer for the before-mentioned health threats (Holt-Lundstad et al. 2010, Cohen 2004). It seems like it is the belief that others will provide aid and necessary resources that buffers one's perceived ability to cope with demands and stressors (Cohen 2004). Feeling this buffering support may change the apprehension of the situation and lower the experienced effective stress in the situation. It is also suggested that the experienced social support may decrease the emotional and physiological responses to the stressors experienced and this may prevent or alter behavioral responses that may be hazardous to health. The actual received support may also be beneficial to health, received support may diminish the impact of stressors by providing a solution to the problem or reducing the perceived impact of the problem or just offer a distraction from it (Cohen & Wills 1985, Rostila 2013). There is substantial evidence that perceived availability of social support buffers the effects of stress and thereby promotes health[4] (Cohen & Wills 1985, Cohen 2004).

3.2.5 The main effect model

In contrast to the stress-buffering model the main effect model regards social integration and structural social capital in the form of connectedness as beneficial for health, regardless if one experiences stress or not (Cohen 2004). The main effect model presumes that participation in social networks of different kinds puts individuals under different forms of social control. The social control and peer pressure experienced from other individuals is thought to influence

[4] For more information regarding on the stress-buffering model see the literature review of Cohen, S., & Wills, T. A.(1985). "Stress, social support, and the buffering hypothesis." Psychological Bulletin, 98,310–357.

normative health behaviors. Networks may influence whether an individual exercises, has a healthy diet, smokes or uses illegal drugs. Feelings of integration in social networks may also result in feelings of responsibility for others, which in turn may lead to an increased motivation to take care of oneself, so that one is able to fulfill this responsibility (Rostila 2013, Cohen 2004).

Social capital in the forms of participation and integration is also suggested to provide a sense of belonging, identity and feeling of stability in the surroundings, because of a demonstrated ability to meet normative role expectations (Rostila 2013). Shared role concepts in a group help with guidance in social interactions. The roles provide a common set of expectations about how people should act. When individuals meet normative role expectations, they gain a sense of identity and stability. This creates feelings of belonging, being respected and valued by others and thereby gives everyday life stability by providing purpose, meaning and self-worth (Halpern 2005, Cohen 2004). Interacting with others also play a part in the regulation of our emotions, which in turn is thought to reduce the intensity and duration of negative mind states (Cohen 2004). For example, one can perceive challenges in one's situation to be of less importance, and thereby be protected against negative emotions such as stress and hopelessness (Halpern 2005). These positive emotions and cognitions are thought to influence health in a beneficial way because they reduce psychological despair and results in greater motivation to take care of oneself. This may also reduce neuroendocrine responses and enhance the immune function, and thereby influence physical health directly (Cohen 2004).

Being in possession of several outreaching networks in line with the theories of Granovetter (1973) and Putnam (2000) may also be beneficial to health, because it may provide information influencing health. With more extensive interactions and higher levels of involvement, the more likely and less costly can the individual access information on lifestyle, how to prevent disease, which hospitals provide the best health care and where the best physicians are located (Rocco & Suhrcke 2012, Huijts 2011). Being in possession of network relations and family may also influence health directly by the provision of informal health care and support in cases of illness. Even in developed countries where formal health care is ubiquitous there still exists a substantial demand for informal health care and assistance in cases of temporary illness, like babysitting or grocery-shopping (Halpern 2005). For instance, it is believed that care and assistance provided in the home is roughly equivalent to the public health care services among children and adolescents with special needs in Norway (St.Meld. Nr. 18. (2011-2012)).

3.2.6 Collective social capital and health

The health impact of social relationships such as friendship, community and workplace colleageus identified at the individual level indicates the importance of community social capital in health. Collective social capital is a feature of social structures, and the pathways linking collective social capital and health differ from those at the individual level (Rostila 2013). The assumption is that collective social capital is something over and above individual social capital (Huijts 2011, Rostila 2013). In other words, that some communities create a positive atmosphere that contributes to increasing the average level of health more than expected from the individual circumstances (Halpern 2005). Unlike social capital at the individual level no models has been developed for explaining the influence of collective social capital on health. Different explanations and mechanisms are proposed in the literature but some of the mechanisms have a rather indistinct character (Rostila 2013). The contextual level mechanisms emphasize that social capital either influences or is influenced by social structures and conditions that in turn may influence health (Halpern 2005).

The influence of collective social capital on health is often referred to as environmental effects (Halpern 2005). Again it is possible to draw a line to Durkheim's ([1897] 2006) study of suicide. This is a classical example of environmental effects as the structure of society exerts control over the citizens' behavior. It is suggested that community social capital may influence different groups unequally (Lin 1999). Two contrasting mechanisms exist for explaining the possible unequal gains from contextual social capital (Huijts 2011). The accumulation hypothesis assumes that high levels of social capital will only benefit individuals who are already in possession of high levels of individual social capital. In order to benefit from extensive high quality networks you need access to them in the first place (Huijts 2011, Portinga 2006). In a study by Portinga (2006) national level social capital was found to mainly have health benefits for socially active individuals. Socially active individuals with high levels of social capital in their surroundings have also been shown to have less risk of developing mental illness (OECD 2010).

In contrast to the accumulation hypothesis, the compensation hypothesis assumes that instead of providing members with high levels of social capital with effects that are beneficial to health, living in a context with high levels of community social capital may instead be beneficial for those who lack social ties. Dense social networks may lead to spillover effects. Individuals

belong to multiple social networks, and as a result effects and information which are beneficial for health through integration in a certain network may be passed on to other people outside the network. Individuals lacking social capital may indirectly benefit from living in a community with high levels of social capital and thereby compensate for their lacking relations (Putnam 2000, Huijts 2011). To sum up the theoretical contributions and disentangle some of the conceptual confusion around social capital there is constructed a conceptual model of social factors, social capital and health which is provided in figure 1.

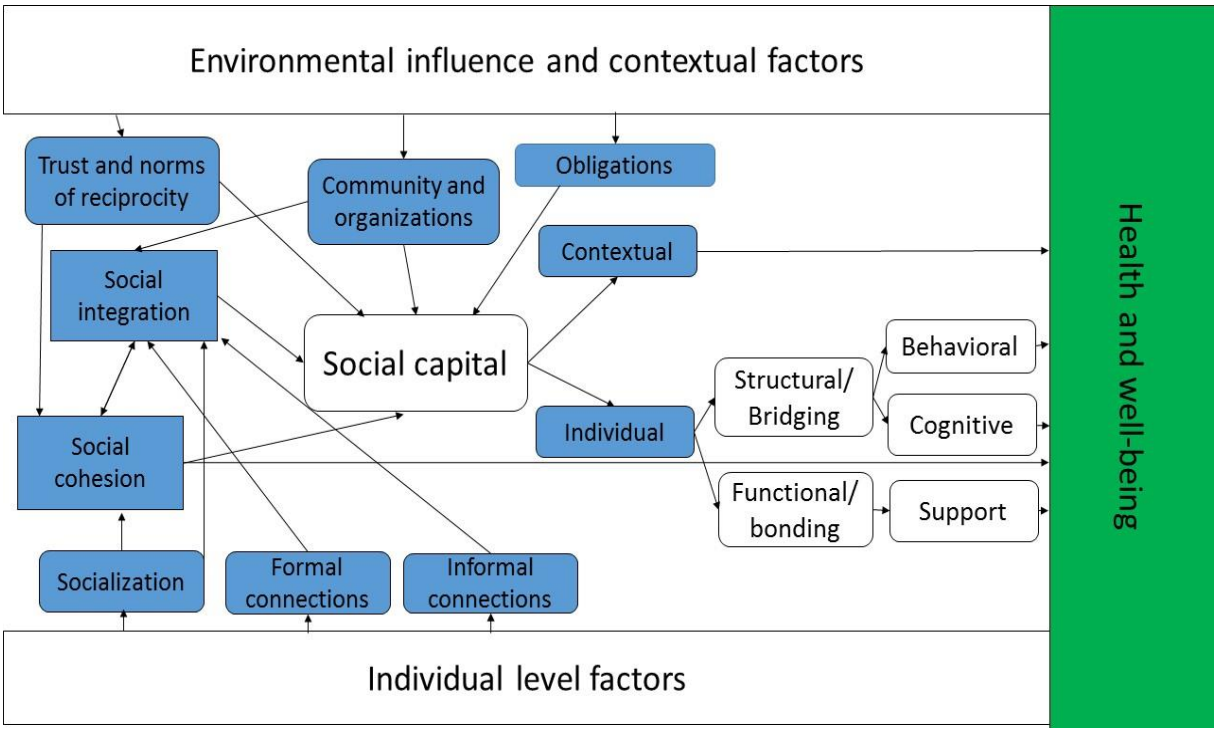

Figure 1. A conceptual multi-level model of social capital in health research

3.2.7 Causality between social capital and health

Establishing the causal relationship between social capital and health has proved to be a difficult task, and the causal nature of the relationship remains unclear. At the individual level it is difficult to isolate the effects of variables such as social support, trust, the extent of networks etc. This is even more complex at the community and national levels (Pearce and Smith 2003). It is possible to interpret the relation in different ways. For instance, an association between a qualitatively weak network and poor health or low levels of well-being could initially be caused by poor health and health problems, which then lead to lacking social relations for the individual. Due to their lack of good health and their bodily insufficiency, the individuals in

question fail to establish and maintain a strong supportive network. However, it is also possible to imagine other situations where the influence of the social capital link is reversed, where lack of support, isolation and loneliness are the cause of poor health (OECD 2010, Halpern 2005). If individuals are experiencing a social handicap, such as severe shyness that prevents them from participating in a network, there is little doubt that isolation comes first (Halpern 2005).

There are many circumstances that influence the relation. Halpern (2005) has suggested that selective perception may be a problem when examining social capital and health. For instance, it is possible to assume that depressed people can experience symptoms as more severe than they really are, and the levels of support as lower than what really is the case. Likewise it is possible to assume that optimistic individuals will play down symptoms of disease and perceive levels of support higher than the support available (Halpern 2005).

The before mentioned examples simplify reality, and the compositional link between social capital and health is much more complex. A more nuanced explanation for the strong correlation between social capital and health is due to the fact that the concepts strengthen each other. It is more likely that individuals experiencing good health are more able to participate in social life, and similarly people who are more involved in social networks are expected to benefit more from their social support. There is room to talk about a double causality mechanism (OECD 2010). The issue of possible interpretations of causality presents a considerable challenge in understanding the causal relationship between social capital and health. Here the causal relationship will be interpreted from social capital to health, but the uncertainties associated with the relation are important to keep in mind.

3.3 The role of social capital in explaining socioeconomic health inequalities

Little is currently known about how social capital influences socioeconomic inequalities in health and empirical investigations on the topic are scarce (Pichler & Wallace 2008, Rostila 2013). There exist strong evidence that individuals with lower socioeconomic positions generally have lower levels of social capital (Berkman & Glass 2000, OECD 2010). There also exists some evidence that lack of social capital is related to socioeconomic inequalities in health (Rostila 2013, Pichler & Wallace 2008). This connection between socioeconomic position and social capital has often been neglected in the literature (Pichler & Wallace 2008, Lin 1999). Lin (1999) has pointed out that differential access to social capital between socioeconomic groups

deserves greater research attention in order to understand the mediating effect of social capital between socioeconomic positions and health.

As we have seen, socioeconomic inequalities in health are widely documented. Consequently, individuals in the lower socioeconomic groups have shorter lives and experience more health problems than individuals in higher socioeconomic groups (OECD 2010, Mackenbach 2006, Rostila 2013, WHO 2003). The health gradient by socioeconomic position in society cannot be explained by genetic factors or level of income alone (Kerckhoff 2001, CSDH 2008). Social determinants are thought to play a key role in explaining the socioeconomic health inequalities and have been suggested as a possible explanation for socioeconomic health inequalities (Rostila 2013). Social capital is a key determinant of the social determinants of health, and this clearly points toward an association between social capital, education and health (Ross & Wu 1995). To get a grip on the relation between social capital, education and health inequalities we have to look at how social stratification grants different social groups unequal opportunities to accumulate and benefit from social capital. Social stratification is the hierarchical arrangement of individuals into different groups with shared socioeconomic conditions in society (Kerckhoff 2001). In the following we will examine how social stratification may influence the role of social capital in educational health inequalities.

3.3.1 The social stratification process of education

Social stratification puts individuals into groups based on their socioeconomic characteristics. Most of the literature focusing on the relationship between social stratification and social capital have seen education as a major contributor to the process that sorts individuals into strata in society (Kerckhoff 2001). Education works as a stratifying tool with regard to social positions in the social hierarchy. Individuals pass through the educational system and obtain different educational credentials. Educational attainment is a major determinant for one's socioeconomic position. This makes education a particularly important dimension of social stratification since it also influences the social positions one is able to obtain later in life (Rostila 2013, Winkleby et al. 1992). The credentials obtained have lasting effects on one's life opportunities for the rest of the individual's life. In particular occupational attainment depends heavily on educational attainment and occupational attainment is one of the greatest contributors to social stratification in modern societies (Kerckhoff 2001, Ross & Wu 1995). The stratification process results in that different groups in society get unequal access to social capital that provides them with different opportunities, differential access to resources, autonomy and power. This suggests that

its not just the amount of social capital that is thought to vary, different groups may also experience different forms of social capital (Lin 2000). The differences in access to and returns from social capital between socioeconomic groups may in turn influence health and thereby contribute to health inequalities (Rostila 2013).

3.3.2 Educational attainment and differential access to social capital

Education is a major contributor to one's socioeconomic position, but how can socioeconomic position influence the individual's access to and returns from social capital? Educational attainment may influence the access to and how one benefits from the returns of social capital. One of the suggested ways in which education may shape one's life chances is through the accumulation of social capital (OECD 2010). Education has been pointed out as one of the most consistent predictors of social capital (OECD 2010, Putnam 2000). This is thought to be a result of different positions in the social hierarchy being associated with different sources of social capital. It is believed that the higher educational groups have access to multiple sources of social capital and also have more resources in their surroundings in comparison to their less educated counterparts (Ross & Wu 1995). Education may promote the accumulation of social capital directly, by teaching individuals the necessary social skills that facilitate participation in groups and organizations. Education is also suggested to have an indirect effect on the accumulation of social capital by reducing opportunity costs of participation and thereby promoting accumulation of more social capital (Kerckehoff 2001). The higher accumulation of social capital in the higher educational groups may partly explain why social capital contributes to socioeconomic health inequalities, and the effects of stratification by education become an important factor in understanding the role of social capital in regard to health inequalities (Ross & Wu 1995, Pichler & Wallace 2008, Lin 2000, Kerckhoff 2001, Rostila 2013).

The social stratification process by educational attainment is also closely interwoven with how individuals choose to structure their social relationships (Song 2009). To a large degree, position in the social hierarchy influences who we befriend, where we live, who we marry and which activities and organizations we participate in. People tend to seek persons who share similar socioeconomic characteristics as themselves, and persons located at the bottom of the socioeconomic hierarchy are in danger of being trapped in networks deficient in resources, with many contacts of similar type (Lin 2000). While persons located in the higher socioeconomic groups tend to have more outreaching contacts through their networks and may benefit from a more varied specter of resources, which may be helpful in a multitude of situations (Lin 2000).

This notion is supported by a study conducted by Pichler & Wallace (2008) that provided empirical evidence that social capital in various forms is stratified according to social position in Europe. The largest differences in social capital were found in the arise of formal relations, it seemed like higher socioeconomic groups are embedded in a broader range of networks through their activities in formal organizations. Individuals in the upper socioeconomic groups meet different kinds of people more often, while people lower on the social ladder tend to have a smaller circle of social connections. The upper socioeconomic groups were also shown to participate in activities more often and organizations that consist of members of different interest groups that are in possession of different skills, connections and resources. This may be beneficial as knowing different kinds of people may help coping with different situations, while knowing similar people may limit the number of situations one could benefit from social capital in one's network, and also limit the possibility to move out of a social position (Pichler & Wallace 2008). Persons higher in the social hierarchy may therefore experience higher returns from their social capital and benefit from it in a larger range of situations, which may play a part in explaining health inequalities.

Another study that support this notion found large inequalities in social capital among educational groups in European welfare regimes (Rostila 2013). In this study individuals with lower levels of education had significantly lower levels of social contacts, social trust and social resources. Rostila (2013) concludes that such inequalities could contribute to socioeconomic health inequalities. However, the contribution of social capital depended greatly on the dimension of social capital under study and the welfare state context. Social and institutional trust contributed most to the health inequalities by education in the social-democratic regimes, while differences in social resources were relatively more important in Mediterranean and post-socialist welfare regimes. The relative modest contribution of social resources to educational inequalities in health in the social-democratic welfare states may be a result of the fact that individuals in universal welfare states are less dependent on their social networks for material support as the state provides the necessary material aid. Rostila (2013) concludes that individual social contacts, social trust and social resources are important social determinants of health irrespective of welfare state regime context in Europe.

3.3.3 A mediating effect of social capital on educational inequalities in health

The social stratification process also influences our exposure to risk factors to health (OECD 2010, Mackenbach 2006). The health gradient between educational groups is well documented,

and studies on the link between education and health have shown that the lower educational groups are overrepresented on almost all risk factors to health (OECD 2010, Mackenbach 2006, CSDH 2008, WHO 2003, Rostila 2013, Sund 2010). Individuals with little education are more likely to be unemployed, less likely to work full time, have lower levels of income, less sense of control over their lives, experience less social support, are more socially isolated, smoke more, consume more alcohol and are less likely to exercise regularly etc. (Ross & Wu 1995, Culter & Lleras-Muney 2007). It may therefore be room to talk about a double effect. The location in the stratification system shapes our exposure to stressors and risk factors to health, but it also influences the amount of resources we have available to cope with the stressors and risk factors experienced (Ross & Wu 1995). The exposure to the risk factors to health themselves may partly explain the socioeconomic inequalities in health, but the greater amounts of social capital in the higher educational groups may also contribute to the socioeconomic health inequalities with a protective effect when one needs to cope with the risk factors. For example, through lifestyle norms such as focus on having a healthy diet or avoiding hazardous behaviours such as smoking in the higher educational groups (Ross & Wu 1995, Pichler & Wallace 2008).

Against this background, it is possible to suggest that social capital may have a mediating effect on the relationship between socioeconomic position and health inequalities. Individuals with lower socioeconomic position generally have lower levels of social capital, and that the lack of social capital may make these groups more prone to ill health (Uphoff et al. 2013). In a review article on the relation between socioeconomic position and social capital on health Uphoff et al. (2013) provided evidence for two interaction effects that contribute to socioeconomic health inequalities. The first effect showed that social capital such as social support, social cohesion and emotional support from family members can provide protection from some of the effects of a lower socioeconomic position on health. This indicates that persons low down on the social ladder will be less vulnerable if they have high levels of social capital. The other effect showed that certain types of social capital can only benefit the health of those who have access to them and may harm the health of those who are excluded from the relevant networks. Outreaching networks are more beneficial to health since they can offer help and solutions in a large range of settings. Since these kind of connections are more common among higher socioeconomic groups they will benefit most from this kind of capital (Uphoff et al. 2013).

The cited studies strengthen the assumption that social capital is unevenly distributed in society and could play a role in the preservation of social health inequalities. The effects of social capital on health will vary in both scale and nature according to socioeconomic position. Their findings illustrates the importance of social stratification in accessing social capital. It seems like the higher the initial social position the higher the quantity and quality of resources reached through their social connections. As with human and economic capital, there are reasons to believe that the higher socioeconomic groups in the population have higher social capital in the form of larger social networks, higher levels of trust, higher sense of personal control, more social support and resources of higher quantity and quality than their counterparts (Rostila 2013, Lin 2000, Ross & Wu 1995). It is a paradox that the educational groups who needs social capital the most to cope with their disadvantaged situation are those least likely to have it (Ross & Wu 1995). It is important to regard the unequal distribution of social capital in society as a downside to social capital (Pearce & Smith 2003). More, Stewart and Teixeira (2013) have suggested that interventions targeting health inequalities should aim both at reducing socioeconomic inequalities alongside with efforts to increase social capital in society, through increased actual and perceived social connectivity. Higher levels of education and social capital seem to be important determinants for health and may strengthen each other in contributing to socioeconomic health inequalities; the mechanisms are, however, unclear. In a report by the OECD (2010) the need for methodological solutions to identify these mechanisms is stressed.

In figure 2 we have constructed a conceptual model of the relationship between social capital, education and health. Both the amount and type of social capital may be beneficial when individuals are exposed to risk factors to health according to the situation. According to Uphoff et al. (2013) persons in possession of low socioeconomic status may avoid or be able to cope with some of the risk factors associated with lower socioeconomic position if they are in possession of high levels of social capital. While certain types of social capital will only have a protective health effect if the actors have access to them through outreaching networks most commonly found in the higher socioeconomic groups. Social capital may therefore mediate the association of education and health positively by helping individuals cope with experienced risk factors, or avoiding them in the first place.

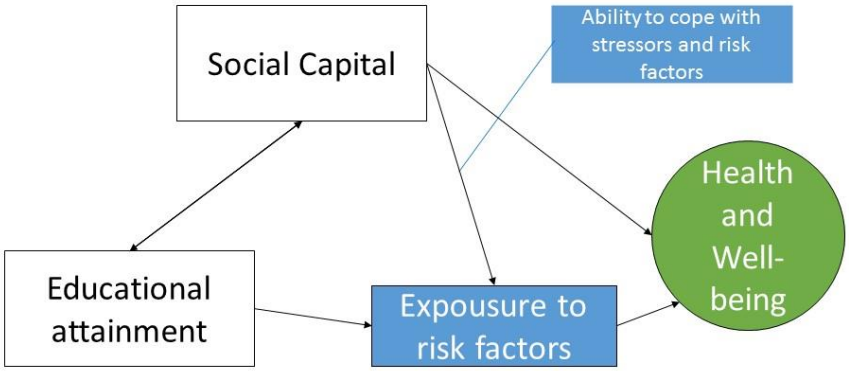

Figure 2. A conceptual model of social capitals mediating effect on the relationship between education and health

3.4 Old term in new wrapping? Critique of social capital in health research

Before we move on to examine social capital's role in health inequalities it is important to discuss some of the critique aimed at social capital in health research. Like in other research fields concerned with social capital, there does not seem to be any theoretical consensus among researchers regarding the influence of social capital on health. Despite the concept's lack of clarity it has been adopted by governments, the World Bank and other organizations as guidance for both public health research and practice (Lynch et al. 2000, World bank 1998, Halpern 2005). This has led to criticism of social capital, as it has been claimed that the concept in fact risks trying to explain too much with too little or uncertain knowledge. Research making use of the concept of social capital has also been criticized for uncritically adopting the concept without taking account of its underlying theoretical and ideological implications (Lynch et al. 2000). The debate on the theoretical uncertainties linked to social capital in health research is complex and beyond the scope of this thesis to investigate. It is, however, important to mention a few key points in the critique of the concept, as they illuminate why this type of explanatory research is important to the understanding of the relation of social capital to health inequalities.

The term social capital links together quite a large number of phenomena, for instance, social integration, social networks, resources, civil society, voluntary work, community capacity and

more (OECD 2010). Social capital has been used in the literature about all kinds of formal and informal reciprocal links among people at the individual, community and national level. It also combines the economic concept of capital with social concepts such as trust and fairness, and as a result of this social capital takes its place alongside economic and human capital as a fundamental force in the smoothing of functions in society and economic growth (OECD 2010, Pearce & Smith 2003, Sund 2010). Despite its popularity, no shared definition of social capital has been developed, and social capital remains to be fully defined and understood. There is an abundance of definitions of social capital and correspondingly many different ways to use the concept. Such arbitrary use of social capital makes the concept appear as diffuse, and may undermine the reliability of social capital in health research (Rostila 2013). If these problems are not recognized there is a risk that social capital will lose its significance as a theoretical construct and become synonymous with everything that is positive in social life (Portes 1998). If one does not succeed in agreeing on an operational definition of social capital, it may be in danger of becoming a rhetorical concept. Rostila (2013) has argued that in order to be able to generate well-developed and specific mechanisms that contributes to the understanding of the influence of social capital on health and health inequalities, it is necessary to have a distinct definition of social capital that emphasizes the core of the concept and thereby relates more explicitly to different health outcomes.

The concept of social capital has also received criticism for not contributing anything new, and just being an examination of old concepts under a new label. It is true that social support, relations and network integration have been examined earlier. However, with the focus on social capital several new elements appear. In the social capital research strand it is for instance possible to examine to what degree and under which conditions social connectedness constitutes an important resource (OECD 2010). The social capital approach also implies an interest for the conditions where these kinds of resources are created and maintained. Social resources do not emerge from nowhere, and it is important to document the whole process from the accumulation of social capital to its health effects if we are going to get a complete understanding of the causal link to health (Rostila 2013). The main advantage of the social capital approach is, however, the potential of social capital to work as a knowledge base for policies, with its increasing popularity in a number of sciences and also its presence in the public debate, social capital may be seen as a valuable tool in explaining health inequalities. Social capital is well suited for this task as it proposes an explanatory model that embraces economic, social and cultural factors available to the population and their influence on health, and guides

policy makers' consciousness to the qualities one should aim for in the maintenance of a successful and well-functioning society (Sund 2010, OECD 2010).

This potential guidance for policy makers may be one of social capital's greatest strengths, but it is also possible to criticize how social capital has been treated in policy making so far. Baum (1999) has criticized the possible political interpretations which the unclear social capital concept may lead to, where those on the right of the political spectrum may use social capital as an opportunity to argue for a withdrawal of the state from welfare and social provisions, while those more toward the left may argue that the state is crucial for the accumulation of social capital. As a result of this, Baum (1999) criticizes the suggested mechanisms of social capital's effects on health for being too open to interpretation and the current literature for being confusing and lacking both terminological precision and theoretical rigor.

Rostila (2013) has also criticized the suggested models for explaining the influence of social capital on health. It is possible to argue that the direct-effect model and the stress-buffering model suggest too many pathways by which aspects of an individual's social capital influence mental and physical health. Their main limitation is that the proposed mechanisms are non-specific regarding the causal chain in which social capital ultimately influences health. They are all-embracing, but still vague concerning the ways in which social capital "gets into our bodies" and thereby affects our health (Rostila 2013).

Research on social capital has also been criticized for only emphasizing its positive outcomes. An aspect of social capital that receives increasing attention in research on social capital and health is its darker side. Islam et al. (2006) have criticized research on social capital for failing to consider its negative outcomes, social capital is not a unique cure for health problems among the population and may not always facilitate better health outcomes. Social capital could in some instances have adverse consequences for health. Despite this fact the majority of studies on social capital and health assume that social capital mainly has positive consequences (Rostila 2013).

To summarize the critique aimed at the concept of social capital there are considerable theoretical challenges for further research on social capital. It is of high importance to sort out the jumble of definitions that exist and to provide clearer guidelines for theory development,

measurement and differences between social capital indicators that today still to a large degree remain unclear. Social capital appears as an appealing approach to explaining differences in health, but many of its effects are still not well understood.

3.5 Summary of theory and previous research

Socioeconomic inequalities in health are persistent and remain one of the major challenges to public health (Mackenbach 2006, CSDH 2008, OECD 2010). In order to be able to tackle the challenge of socioeconomic inequalities in health, more knowledge of the underlying mechanisms causing the health inequalities is needed (OECD 2010). Research has pointed toward social determinants of health as a key factor in explaining the socioeconomic health inequalities. This indicates that social capital may play an important role in the explanation of health inequalities (OECD 2010, Sund 2010, WHO 2003). However, the role of social capital in the explanation of socioeconomic health inequalities has often been neglected in the current literature, and evidence for how social capital influences socioeconomic health inequalities is scarce (Pichler & Wallace 2008, Rostila 2013).

The empirical evidence for the influence of social capital on health is overwhelming, and social capital is thought to influence health in several ways at multiple levels (Halpern 2005, Carpiano 2006, Cohen 2004). The initial theories on social capital provided by Coleman and Putnam has led development on social capital and health further. Two models have received widespread acceptance for explaining the socio-biological link between social capital and health at the individual level, but the same models are criticized for not explaining how social capital gets into our bodies (Cohen 2004, Cohen & Wills 1985, Rostila 2013). At the collective level social capital's relation to health is less well understood and no specific models have been suggested (Huijts 2011, Halpern 2005).

Social capital's role in socioeconomic health inequalities is most likely closely related to the process of social stratification. Like human and economic capital, social capital is unevenly distributed among the social groups in society (Ross & Wu 1995). The differential access to social capital among groups in the social hierarchy may play an important part in explaining the educational health inequalities in Europe. In the following sections we will take the knowledge base for social capital further by investigating what would happen to educational inequalities in all-cause mortality if differences in social capital indicators are eliminated. This will contribute new understanding concerning the influence of social capital on educational

health inequalities in Europe. Only by understanding how different dimensions of social capital are related to health inequalities will it be possible to develop new and innovative health policies and interventions to obtain the highest possible level of population health (Cohen 2004).

4. Data and Methods

4.1. Data

In order to conduct the analysis and be able to estimate the influence of social capital on health inequalities in Europe it was necessary to gather data from multiple sources. We needed prevalence data for the distribution of social capital between educational groups in the European countries, risk ratios of the social capital indicators chosen to simulate their impact on health, and mortality data from the European populations under study to estimate the health impact a redistribution of social capital would lead to in the populations and regions under study. It was chosen to gather prevalence data for social capital from the first two rounds of the European Social Survey (ESS 2002, ESS 2004). Data from the ESS were chosen because it contains several measures of social capital gathered with similar questions and in the same time period in all countries under study. Unfortunately, data for all populations were not available for both rounds of the European Social Survey, for an overview of the data material from the European Social Survey used in this thesis se appendix table A1.

Relative risks for the impact of the social risk factors on mortality were collected from a large meta-analysis making sure that the estimates of relative risk were adjusted for the effect of relevant confounders (Holt-Lundstad et al. 2010). Risk factor data used in the calculations can be found in Appendix table A3. The available social capital indicators in the ESS were then matched with relative risk factors from the meta-analytical review of social factors impact on health (Holt-Lundstad et al. 2010, ESS 2002, ESS 2004, ESS 2012a, ESS 2012b). After variable matching and careful selection, it was possible to harmonize five indicators of social capital for use in the further analysis. Fortunately, it was possible to match indicators from both the functional and the structural sub-construct of social capital.

Further, the selected data were combined with the EURO-GBD-SE mortality data in order to be able to estimate the health impact a redistribution of social capital would result in for the European populations (EURO-GBD-SE 2013). The mortality data used in this thesis cover men and women aged 30-79 in 16 European countries in the time period ca. 2000- ca. 2005. The populations covered are those of Norway, Denmark, Sweden and Finland in the North; Scotland, England and Wales in Britain; the Netherlands, France, Belgium, Switzerland, and Austria in the West; Spain (Barcelona, Basque Country and Madrid) and Italy (Turin and Tuscany) in the South; and Poland, Hungary, Estonia, Czech Republic in the East. Most data

covered the entire population in question, the exceptions are Belgium, Italy and Spain. For these countries data were limited to regional territories (Madrid and Basque Country) and the urban areas (Brussels, Turin, Tuscany and Barcelona). All datasets are representative from the general population. The main sources of mortality data are presented in appendix table A2.

4.1.1 Coding of social risk factors

The only functional social capital indicator Perceived ability to receive support was measured in a yes or no statement through the variable *Inmdisc*. (‘Anyone to discuss intimate and personal matters with’, available in both ESS 2002 and ESS 2004). The four structural social capital indicators were also self-reported measures. Social isolation was measured through the variable *Sclact*. (‘Take part in social activities compared to others of same age’ available in both ESS2002 and 2004) where the categories 1. ‘Much less than most’ and 2. ‘Less than most’ were coded as socially isolated, and the categories 3. ‘About the same’, 4. ‘More than most’ and 5. ‘Much more than most’ were coded as not socially isolated. Marital status was measured through the variable *Marital*. (‘Legal marital status’ available in both ESS2002 and ESS2004[5]) where category 1. ‘Married’ was coded married and the other categories 2. ’separated’ 3. ‘Divorced’ 4. ‘Widowed’ 5. ‘Never married’ 7. ‘refusal’ 8. ‘Don’t know’ and 9.’No answer’ were coded as not married. Living alone was measured through the variable *Hhmmb*. (‘Number of people living as a regular member of household’ available in both ESS2002 and ESS2004). The variable was split into two categories: one for persons living alone, and one category for the remaining. social participation was measured ‘Participation in at least one voluntary organization the last year’, ‘no such participation’ (was already available in the EURO-GBD-SE (2013) data). Prevalence data showing the distribution of the social capital indicators among educational groups for each population is provided in appendix tables AB1-5.

4.1.2 Stratification of the data

The thesis is focused on educational inequalities in mortality, and data on educational attainment is available for both men and women in all European populations under study. This is fortunate because educational attainment is apprehended as a stable measure of socioeconomic position. Education can be viewed as a stable measure of socioeconomic position because educational attainment is normally completed in early adulthood, which avoids reverse causality problems (e.g., health problems in old age cannot change a person’s

[5] Marital status for the country France was obtained through the country specific variable Martialfr.

level of education) (EURO-GDB-SE 2013, Daly et al. 2002). Educational level was harmonized across countries by use of the International Standard Classification of Education (ISCED) and split into three internationally comparable groups. The educational groups corresponded to less than secondary education (low), completed secondary education (mid), and tertiary education (high). Unfortunately, the ISCED classification variable does not include all populations under study. In cases where it was not possible to use the ISCED educational variable, educational level was obtained through the ESS EDULVLA educational variable and then harmonized into the educational categories[6].

In addition to educational group the health determinant data were stratified by age-group and gender. There are several reasons for the implementation of this stratification. It is known that there are substantial differences in how women and men's educational status relates to health. We therefore stratify by gender to get more realistic estimates. The impact of risk factors on mortality also works differently in stages over one's life-span and according to different causes of death. Respondent data for the ages 13-110 years is available in the European Social Survey but analysis are limited to the age-groups 30-44, 45-59, 60-69 and 70-79. An advantage when starting at age 30 years is that socioeconomic position is well established at this entry point, as most people have finished their education at this age. The highest age groups are omitted because of insufficient data validity and small numbers of respondents in the 80+ age group.

4.2 Method: Population Attributable Fractions

In conducting the analysis a specially developed excel-based tool from the EURO-GBD-SE (2013) project was used. This tool is based on Population Attributable Fractions (PAF)[7] and estimates the impact of counterfactual distributions of the magnitude of the risk factors of social inequalities in mortality (Hoffman et al. 2012). The combined data from the European Social Survey, the meta-analytical review of effects of social factors on health and the EURO-GDB-SE mortality data were loaded into the excel tool in order to calculate PAFs for mortality by population, gender, age-group and level of education, with high education as a reference category. The analysis was conducted in two steps to examine the differences between the educational groups. First age-specific PAFs were calculated, in order to estimate new mortality

[6] This applies to the following countries: Finland, Sweden, France, Italy, Austria, England, Wales and Scotland.
[7] For more information about Population Attributable Fraction method see: Hoffman et al. (2013). The potential impact of a social redistribution of specific risk factors on socioeconomic inequalities in mortality: illustration of a method based on population attributable fractions. J Epidemiol Community Health. 67(1):56-62.

rates and numbers of saved deaths in each age-group (30-44, 45-59, 60-69 and 70-79). Here PAFs were obtained for each separate social capital indicator allowing estimation of % reduction in all-cause mortality by elimination of educational differences in the social risk factors. In the second step the age-specific saved deaths were summed up for the ages 30-79 years and used to calculate the total saved deaths that would be obtained if one succeeded in eliminating educational differences in the addressed social capital indicators separately. This calculation was based on the age-specific calculations. The age-specific saved deaths is included in appendix ABC in tables ABC1-11. They are included because the age-specific approach provides supplementary information to the PAF values, as they contribute with estimations of reduction in all-cause mortality in absolute terms and contribute with specific information on how the social risk factors influence health according to age group.

The educational inequalities in mortality were quantified by calculating rate ratios (RR) and rate differences (RD) from age adjusted mortality rates using high education as a reference category. In this thesis two situational changes in RRs and RDs will be presented. One is comparing the lowest and highest educational groups, and one compares the middle and the highest educational group. Supporting information for interpreting the potential of the social risk factors in reducing educational inequalities in all-cause mortality for the populations studied is included in appendices. The original magnitude of health inequalities of all-cause mortality, the initial RRs are presented in appendix A table A3.

4.2.1 Absolute and relative terms of health inequalities

Health inequalities can be measured in either absolute or relative terms and in this thesis both types of estimates are provided. Absolute terms of health inequalities are the exact difference between two health measures, in this thesis the difference between educational groups divided into low and high or middle and high. Differences in health can also be described in relative terms by using the ratio or the percentage between the two measurement groups. The different measures may provide different pictures for interpretation and it is possible that the absolute differences are small in size while the relative differences are large and vica versa. In order to get a nuanced understanding of a phenomenon, Bartley (2010) has suggested that one should interpret the results in both relative and absolute measures. The interpretation of the results from the upward levelling scenario will mostly be based on relative differences in all-cause mortality between educational groups, but absolute measures of the results are provided in the appendices and will be discussed in relation to the relative results.

4.3 Analysis: Upward levelling scenario

The objective of the analysis is to estimate to what extent health inequalities can be reduced if one succeeds with policy interventions aimed at eliminating educational differences in the addressed social risk factors. The results are obtained through simulation of a counterfactual upward-levelling scenario were each social risk factor is examined separately. The upward-levelling scenario presents a hypothetical situation assuming that exposure to the social risk factors would be reduced to the level currently seen among the highest educational group in each country. The results present a theoretical upper limit to what it is possible to achieve in reducing health inequalities among educational groups in the different countries by tackling the specific social risk factors. The estimations provide information regarding the contribution of the specific social risk factors in the exploration of health inequalities, and may guide policy development and interventions in order to reduce inequalities in mortality by addressing social capital, if inequalities in education would continue to exist as they are now. The scenario estimations also indicates what the most important entry-points for policy are, among the social risk factors studied, in each country. In the uncommon case that the less educated are less frequently exposed to risk factors than the more highly educated, it is assumed that the potential reduction of inequalities in mortality equals zero.

5. Results

In this section the results from the upward-levelling scenario for all age groups will be presented by each separate social risk factor. Appendix A, table A3 presents the initial educational inequalities in all-cause mortality as they were observed in the populations under study, on the basis of the mortality rate differences between the educational groups. The table shows that educational inequalities in all-cause mortality exist everywhere, but vary in magnitude between countries in Europe: the inequalities are smallest in the South, and largest in the Center/East.

In table 1 and table 2 the results present what would happen to educational inequalities in mortality in relative terms if the social risk factor prevalence in all educational groups were equal to the prevalence currently seen among the most highly educated in each population. The results from the PAF calculation are presented in percentage reduction of all-cause mortality for the low educational group in table 1 and the middle educational group in table 2. The separate presentation of the results by educational group allows us to examine the health potential in reducing educational inequalities by social capital at a more detailed level. The tables use color to visualize the potential impact across the separate risk factors, ranging from white (no reduction) to yellow (minor impact) through light green and green (substantial impact). Interpretation of the results will also be guided by graphical figures for the relative estimates. Absolute numbers for saved deaths per 100,000 person years according to age groups (30-44, 45-59, 60-69 and 70-79), all ages and all ages and educational groups are presented in appendices (Age groups Appendix ABC tables ABC 1-8, all ages appendix ABC tables ABC 9-10, All ages and educational groups appendix ABC table ABC 11).

Perception of support

Elimination of educational inequalities in perception of support would reduce inequalities in all-cause mortality for men ranging from 2,3 percent in Poland to 12,4 percent in the Czech Republic and between 1,6 percent in Hungary and 42,9 percent in Turin for women. Implying that between 1,6 and 42,9 percent of all deaths in the low educational group could have been avoided if they had the risk factor prevalence of the highly educated in the same country. The largest reduction was found among women in the Southern populations and women in Estonia. For men the largest impact of perception of support was found in the Czech Republic and in the Spanish regions and cities. Reductions for the same scenario in absolute terms are presented in appendix ABC table ABC9. In most countries one can expect a notable decrease in mortality

among men, often by more than 7 deaths per 100 000 person years, if differences in perception of support between educational groups were to disappear. Reductions are greatest in size in the Southern and Eastern countries, which also have a similar pattern in reduction among women. In the Northern, British and Western countries the reduction of inequalities is much smaller for women, ranging from 2 to 5 saved deaths per 100 000 person years with the exception of Denmark and Austria.

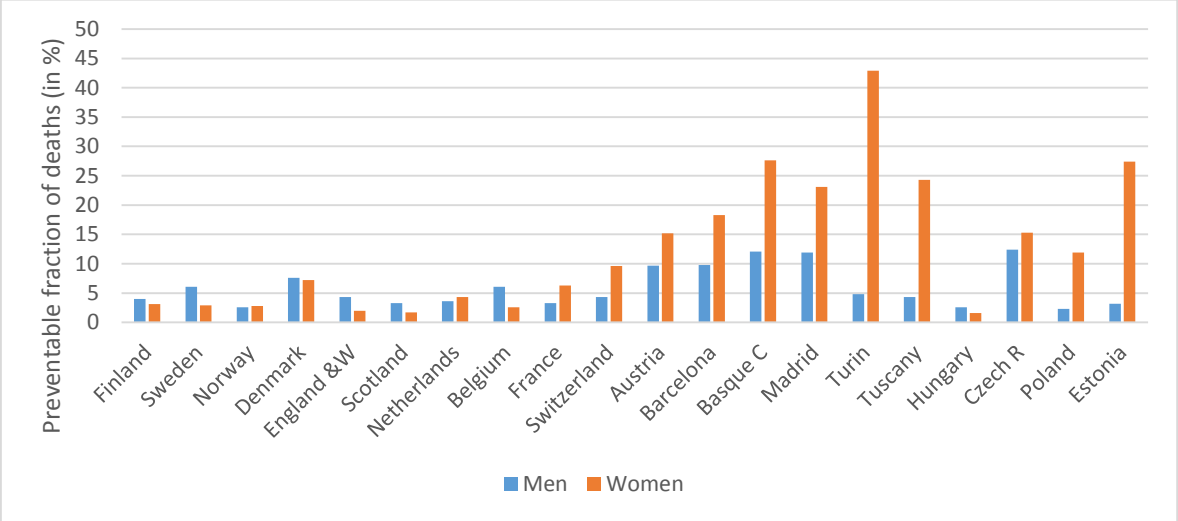

Fig 3. % reduction in educational inequalities in all-cause mortality if educational inequalities in perception of social support among the low and high educational groups are eliminated.

Marital status

An elimination of educational inequalities in marital status would reduce inequalities in all-cause mortality by between 0,7 and 14,4 percent for men and between no reduction at all and 11,3 percent for women. The reduction is of relatively modest size for both genders in the Western and Southern populations with Belgium as an exception. In the Northern and Eastern countries there seems to be a greater reduction in all-cause mortality among men, with the Czech Republic as an exception from this trend. In the British populations the reduction is of comparable size for both genders. Among women in the southern region marital status has no impact on educational inequalities in all-cause mortality at all. Reductions for the same scenario in absolute terms are presented in appendix ABC table ABC9. In most countries one can expect a small decrease in mortality among men, in the Southern countries the reduction varies from 1,31 to 2,65 deaths per 100 000 person years, if differences in marital status between educational groups were to disappear. In the Eastern countries, on the other hand, one could

expect a substantial decrease in mortality ranging from 12,08 to 74,11 saved deaths per 100 000 person years. The reduction is smaller among women in most countries. For women in the Eastern countries saved deaths range from 1,39 to 15,60 per 100 000 person years.

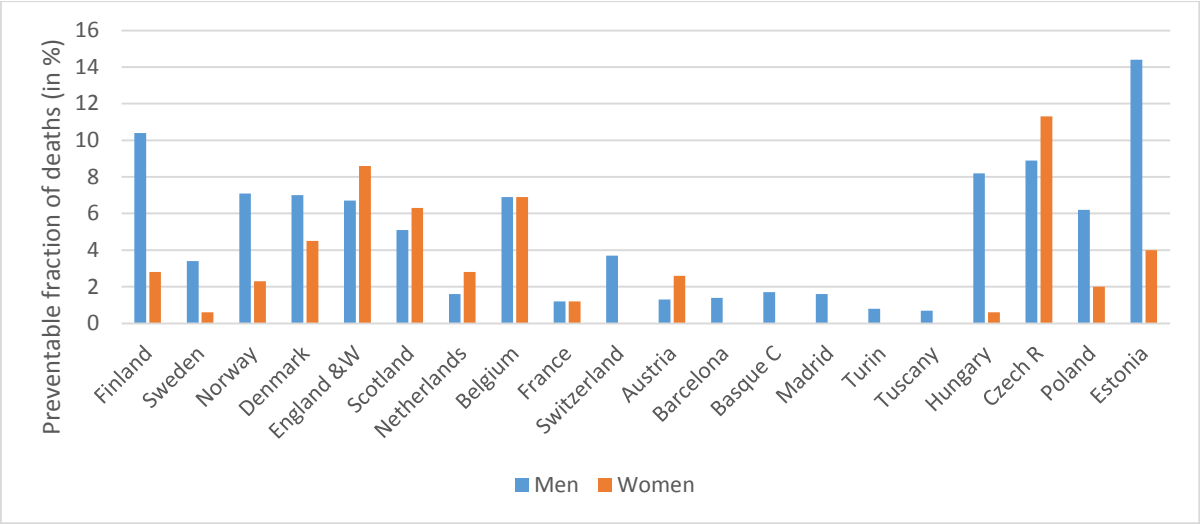

Fig 4. % reduction in mortality if educational inequalities in marital status between the low and high educational groups are eliminated

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Table 1. Potential reduction (in %) of relative educational inequalities in all-cause mortality between low and high educational groups, upward levelling scenario, by risk factor, country and gender.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	4	3,1	10,4	2,8	2,8	9,9	3,7	0,3	11,3	23,2
Sweden	6,1	2,9	3,4	0,6	4,8	10,5	1,7	0	16,3	15,7
Norway	2,6	2,8	7,1	2,3	6,5	10,7	3,3	0,9	5,5	12,8
Denmark	7,6	7,2	7	4,5	12,8	10	2,7	1,1	10	13,5
England &W	4,3	2	6,7	8,6	11,1	12,2	3,4	3	11,7	13,8
Scotland	3,3	1,7	5,1	6,3	Na	na	2,6	2,2	9	10,5
Netherlands	3,6	4,3	1,6	2,8	5,3	9,8	0,3	0	6,8	4,5
Belgium	6,1	2,6	6,9	6,9	9,2	4,8	2,1	7,4	12,6	19,9
France	3,3	6,3	1,2	1,2	9,2	18,1	0,9	0,1	4	16,5
Switzerland	4,3	9,6	3,7	0	Na	na	0	0	6,9	15,6
Austria	9,7	15,2	1,3	2,6	6,2	23	0,7	0,9	12,7	22
Barcelona	9,8	18,3	1,4	0	15,8	9,3	0,4	0	9,5	16,9
Basque C	12,1	27,6	1,7	0	19,4	14,2	0,5	0	11,4	26,2
Madrid	11,9	23,1	1,6	0	18,7	10,1	0,4	0	10,4	20
Turin	4,8	42,9	0,8	0	10	12,5	1,6	0,9	3,5	15,5
Tuscany	4,3	24,3	0,7	0	9,2	7,2	1,5	0,5	3,2	8,8
Hungary	2,6	1,6	8,2	0,6	8,5	5,9	2,7	0	17	7,9
Czech R	12,4	15,3	8,9	11,3	Na	na	2,5	4,5	9,5	16,1
Poland	2,3	11,9	6,2	2	9	4,6	1,7	0	12,5	20,2
Estonia	3,2	27,4	14,4	4	Na	na	3,9	4,1	13,7	19,4

White: no reduction of educational inequalities in all-cause mortality. Yellow: reduction of educational inequalities in all-cause mortality by 0-5 %. Light green: Reduction of educational inequalities in all-cause mortality by 5,1-19,9 %. Green: reduction of educational inequalities in all-cause mortality by at least 20 %. Na: not applicable.

Social participation

Elimination of educational inequalities in social participation would reduce inequalities in all-cause mortality by between 2,8 and 19,4 percent for men and between 4,6 and 14,2 percent for women. Overall reduction of all-cause mortality is high if educational inequality in social participation is eliminated, with only six yellow fields which indicates modest reduction. The greatest health potential is found among women in Austria, were reduction in all-cause mortality is over three times as large as for men. It seems to be a trend in the Northern and Western populations that the reduction is greater among women, with the exception of Denmark and Belgium. Reduction is greater among men in the Southern and Eastern populations with the exception of Turin. The overall potential for reduction in all-cause mortality is also found in the Southern populations. For the British populations reduction in mortality is of comparable size between genders. Reductions for the same scenario in absolute terms are presented in appendix ABC table ABC9. In most countries one can expect a substantial decrease in mortality among men. Reductions are largest in size in the Southern and Eastern countries where they vary from 16,76 to 60,80 deaths per 100 000 person years, if differences in social participation between educational groups were to disappear. In the Northern, Western and British regions reductions in educational health inequalities are more modest, ranging from 6,06 to 25,22 saved deaths per 100 000 person years. For women the reductions are of comparable size in the Northern and Western countries. In the Southern and the Eastern countries, however, the numbers of saved deaths among women are much smaller than for men, ranging from 4,18 to 13,64 per 100 000 person years.

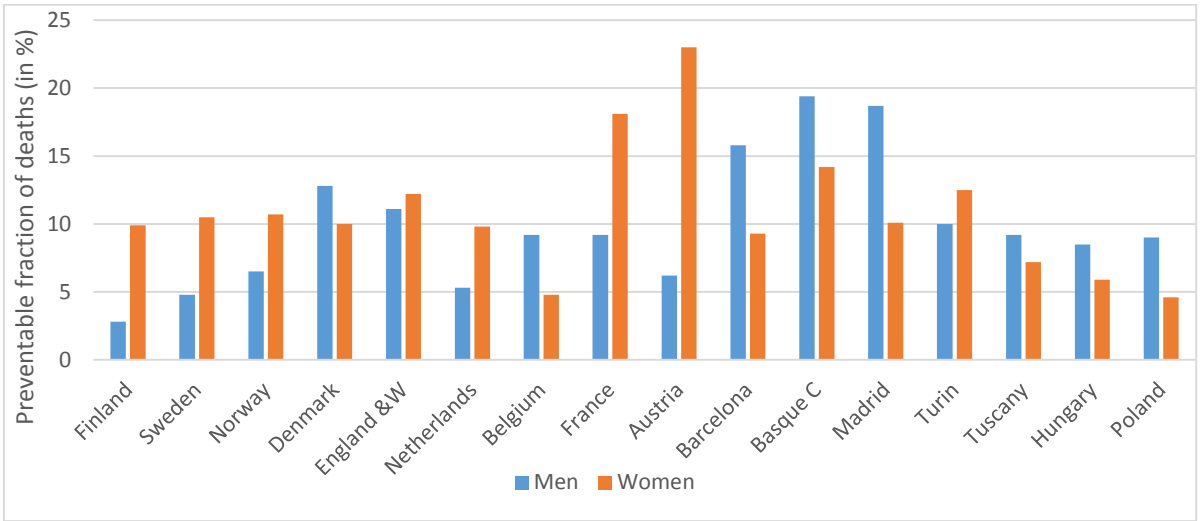

Fig 5. % reduction in mortality if educational inequalities if the risk factor social participation were eliminated among low and high educational groups.
Note 1: Countries that are valued not applicable are not presented in the graph.

Living alone

Living alone is clearly the social risk factor with least potential of reducing all-cause mortality by elimination of educational differences. Reduction in mortality ranges from none at all to 3,9 percent for men, and correspondingly from no reduction to 7,4 percent for women. Women in Belgium are the only population where the reduction is over 5 percent. Reductions for the same scenario in absolute terms are presented in appendix ABC table ABC9. In most countries one can expect from no to a small decrease in mortality for both genders if differences in the number of single resident households between educational groups were to disappear. There are two notable exceptions to this, both found among men in Eastern countries. Among men in Hungary equalization of living alone among educational groups would lead to 19,36 saved deaths per 100 000 person years and in Estonia the corresponding number is 20,18 saved deaths per 100 000 person years.

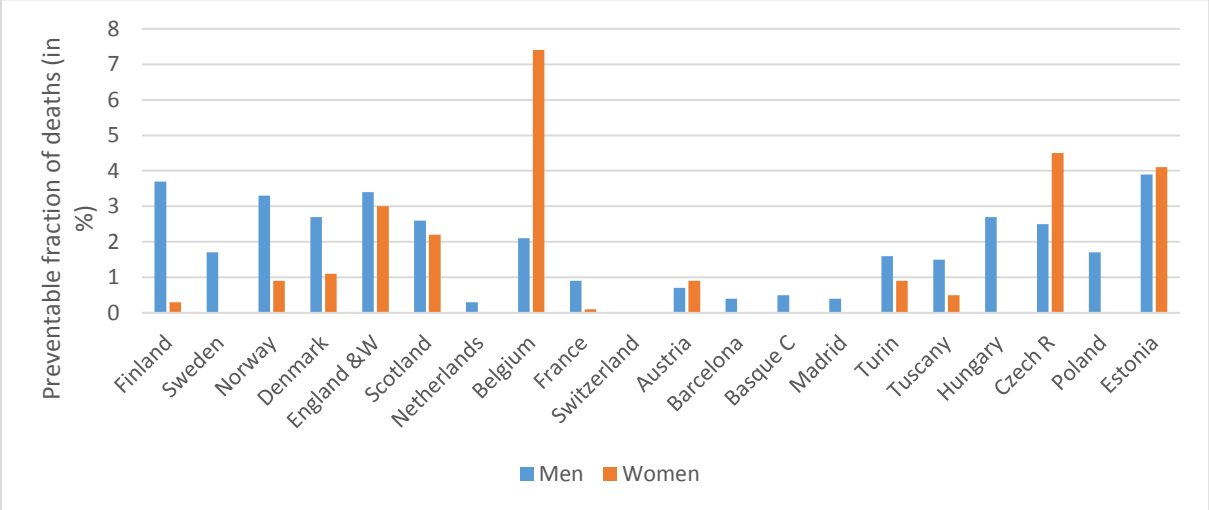

Fig 6. % reduction in mortality if educational inequalities among persons living alone among the low and high educational groups are eliminated.

Social isolation

Social isolation is the social risk factor which poses the greatest health potential of the social capital indicators, with only five yellow fields indicating modest reductions in all-cause mortality if educational differences were eliminated. Reductions in mortality ranges from 3,2

to 16,3 percent among men, and between 4,5 to 26,2 percent among women. Even though we saw higher reductions measured in percent in some populations for perception of support, the overall reductions is greater for social isolation. In the Western, Southern and Eastern regions reduction seems to generally be greater among women, with the exceptions of the Netherlands and Hungary. In the Northern and British regions reductions also seems greater among women, with the exception of Sweden, but in these regions the gap between the genders is smaller in size. Reductions for the same scenario in absolute terms are presented in appendix ABC table ABC9. In most countries one can expect a substantial decrease in mortality among both genders if differences in social isolation between educational groups were to disappear. Reductions are largest in size in the Northern and Eastern countries where they vary from 19,68 to 120,81 deaths per 100 000 person years among men with Norway as an exception. For women the number of saved deaths are comparable to men in the Northern countries, while it ranges from 18,19 to 39,91 saved deaths per 100 000 person years among women in the Eastern countries. For the other Western and Southern countries reductions in health inequalities are also of considerable size among both genders and typically range from 10 saved deaths per 100 000 person years upwards, with a few exceptions.

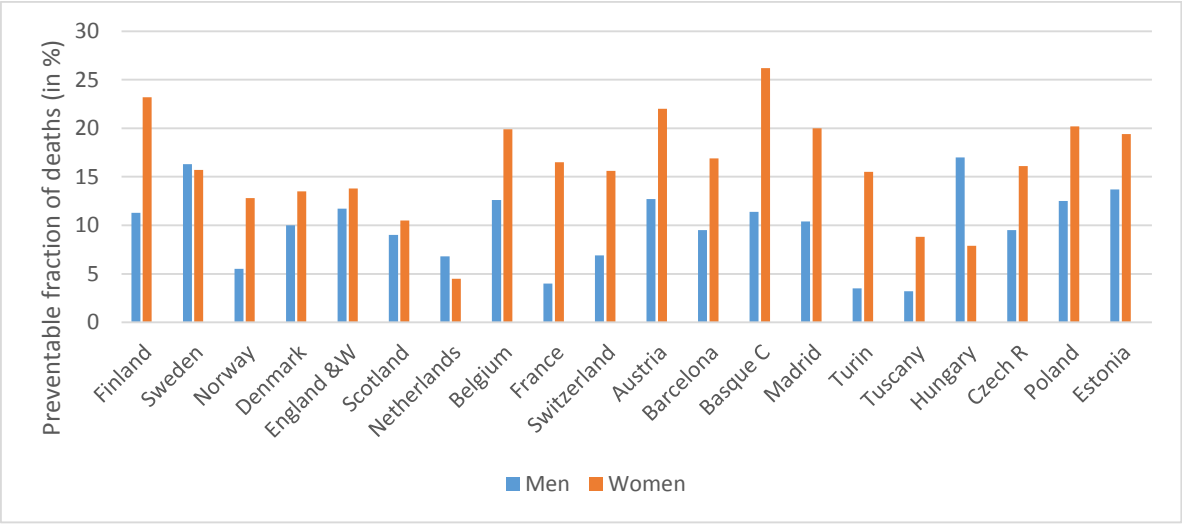

Fig 7. % reduction in mortality if educational inequalities in social isolation between the low and high educational groups are eliminated.

Table 2. presents the reduction in educational inequality in all-cause mortality that would be obtained if educational differences in the exposure to the social risk factors between the mid and high educational groups were eliminated. Many of the trends seen in table 1 are also valid

in table 2. There are, however, some important differences between them. For the social risk factor perception of support, the reductions among women in Italy is 67,5 and 80,8 percent respectively, while the reduction in mortality among Estonian women that was one of the highest reductions in table 1 is now only 3,1 percent. For the risk factor marital status the reduction in all-cause mortality is of substantial size for women in the British countries. For women in Barcelona and the Basque country reduction in mortality is also over 10 percent. Social participation is still one of the most influential risk factors for educational inequalities in all-cause mortality. For England and Wales the reduction in mortality in social participation is of small size for both genders. In the Southern region the reduction in mortality seems to be great for both genders in social participation. The highest reduction in social participation is found in the East among Hungarian women with 85,2 percent. Living alone as in the scenario before remains the least influential risk factor. However, there seems to be a greater reduction in mortality among British and Spanish women than in table one. Social isolation is still the social risk factor where the reduction in mortality is largest. With the exception of Denmark, the Netherlands and Spain the effect of reduction in mortality is much greater among women in the case of social isolation. The reduction in mortality in the whole population of Hungary and Spain and among women in Norway and Switzerland is substantially higher for social isolation in table 2 compared to table 1.

Table 2. Potential reduction (in %) of relative educational inequalities in all-cause mortality between the mid and high educational groups, upward levelling scenario, by risk factor, country and gender.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	4,8	2,8	8,4	2,4	2,2	16,7	2,5	0,0	3,5	19,7
Sweden	11,1	0,9	2,8	0,1	2,1	16,3	2,6	0,0	7,3	13,1
Norway	3,2	2,4	6,5	0,8	3,9	12,5	1,6	0,1	4,0	42,5
Denmark	11,9	10,6	3,5	3,1	9,7	8,4	1,4	0,6	12,3	7,3
England &W	8,1	16,9	7,1	37,8	0,4	1	5,8	26,2	11,8	19,9
Scotland	4,8	9,2	4	21	Na	na	3,4	14,6	6,9	11,5
Netherlands	2,3	7,2	6,2	5,8	6,8	7,3	0,9	3,6	10,7	17,7
Belgium	7,7	1,3	9,8	8,2	4,2	3,1	4,5	7,4	12,4	20,7
France	5,2	10,3	1,6	3,6	11,5	15,4	0,4	1,2	3,3	16,3
Switzerland	0,8	11,6	4,4	0	Na	na	0	0	8,2	33
Austria	9,8	14,2	0	4,3	1,7	32,5	0	0	9,2	7,4
Barcelona	1,8	14,3	0,7	11,4	35,3	46,2	3,8	8,5	27,5	20,7
Basque C	2,3	17,3	1	14,9	44,8	59,2	4,8	11	33,7	27,9
Madrid	1,5	5,6	0,6	4,5	28,3	18,6	3,1	3,4	20,8	7,7
Turin	4,6	80,8	3,1	0,9	23	7,9	6,3	0	3,2	20,7
Tuscany	2,9	67,5	2,4	0,8	16,6	7,7	4,4	0	2,3	18,6
Hungary	3,2	10,4	6,5	4,7	9	85,2	0,9	0	34,5	74,5
Czech R	14,3	16,9	4,5	11,4	Na	na	1,6	2,1	4,5	15,7
Poland	1,4	12,9	2	0,8	7,6	3,7	1,1	0,8	10,9	12,1
Estonia	7,9	3,1	15,3	4,1	Na	na	5,7	5,2	10,1	20,3

White: no reduction of educational inequalities in all-cause mortality. Yellow: reduction of educational inequalities in all-cause mortality by 0-5 %. Light green: Reduction of educational inequalities in all-cause mortality by 5,1-19,9 %. Green: reduction of educational inequalities in all-cause mortality by at least 20 %. Na: not applicable.

6. Discussion

The main problem of interest presented in the introduction to this thesis was *"to examine the role of social capital in understanding and reducing educational health inequalities."* It is possible to point to a few main findings from the results in order to illuminate the role of social capital in the explanation of educational health inequalities. This section contains a discussion of the main findings from the analysis in the light of the existing literature on social capital and health inequalities. It further discusses strengths and limitations with the thesis and provides suggestions for further research.

6.1 Presenting results in relative and absolute terms, clearing up uncertainties

The results from the analysis are presented in both relative and absolute terms with regard to inequalities in mortality. This sometimes leads to rather different pictures of the variation in educational health inequalities between countries, and it is important to explain the reasons for this in order to be able to interpret the results in as much detail as possible. The main reason why the results as presented in absolute and relative terms may lead to rather different pictures is that the relative inequalities in mortality vary between countries in a different pattern than the absolute inequalities (EURO-GBD-SE 2013). For example, due to high average mortality rates absolute inequalities in mortality are particularly pronounced in the Western and Eastern countries. As a result, the reduction in absolute terms may sometimes be very significant in these countries, but at the same time the reduction of the mortality rate ratio is not. An example of this is the reduction in Absolute terms in the perception of support among men in Estonia (one of the largest reductions among the Eastern countries for this risk factor) with 16,41 saved deaths per 100 000 person years (Appendix table ABC9) the same scenario presented in relative terms expresses only a minor reduction in mortality of 3,2 percent in table 1. On the other hand, due to low average mortality rates the reduction of absolute inequalities is often small in the Southern countries even if the relative inequalities are large. When initial rate ratios for mortality are small the relative reduction of mortality easily becomes quite large. This can be illustrated with an example including one Southern and one Eastern population. In table 1. an equalization in social participation would lead to 14,2 percent reduction in educational inequalities in all-cause mortality for women in Basque Country, while the corresponding result for women in Hungary leads to a reduction of 5,9 percent. In the same scenario presented in

absolute terms in appendix table ABC9 the reduction is only 5,67 saved deaths among women in Basque Country while it is 13,64 saved deaths among women in Hungary.

6.2 Discussion of results based on European regions

As demonstrated in the analysis the potential for reducing educational inequalities in all-cause mortality by interventions influencing social capital risk factors is substantial, but priorities for action should not be the same everywhere as there are important country variations. The magnitude in health inequalities and the differential impact of the social risk factors in Europe are to some degree expected, as the different countries have different historical, cultural, economic and epidemiological histories (EUROTHINE 2007). A complete elimination of inequalities in social capital by upward levelling of the prevalence of social risk factors to the level currently seen among the highly educated results in a considerable reduction in educational inequalities in all-cause mortality among both men and women. The impact of social capital on health inequalities does, however, depend both on the chosen risk factor and the population in question. Kunst et al. (1998) have pointed out that varying health inequalities among countries in Europe may impose limits to the exchange of research findings and experience transfer in health policies among European nations, since they are in different situations.

Despite large variations between the genders and countries in the potential for reduction in all-cause mortality, the structural social capital indicator social isolation seems to be the risk factor with the greatest potential for reducing educational inequalities through Europe. The proportion of all-cause mortality preventable by a redistribution of social isolation to the level observed among the highest educational group is typically between 5-15 percent among men and often 10 percent and higher among women in Europe. As opposed to the results in relative terms, however, the health potential for intervening on social isolation is much greater in absolute terms among men than women. These results are in line with previous research on social health inequalities which has concluded that health inequalities tend to be greater among men in Europe, although the results are not directly comparable (Mackenbach 2006).

In comparison to social isolation the functional social capital indicator social support and the structural indicator social participation also show considerable potential for reductions in educational health inequalities in Europe. As is the case with social isolation, there are also important variations in entry-points between countries in the estimations. Social isolation was

not the most influential risk factor in all populations under study, and interventions targeting social participation and perception of support may also offer considerable health effects. For example, the potential for reducing educational inequalities in all-cause mortality in perception of support is greater than the potential in social isolation in the Southern countries, especially among Italian women. This suggests that public health policies in the Southern countries should target perception of support rather than social isolation in order to reduce educational health inequalities. It also indicates that both the structural and functional sub-constructs of social capital are of importance for educational inequalities in health. These findings are in line with previous research on social capital and health which has suggested that the two sub-constructs are of importance for health (Holt-Lundstad et al. 2010, Eriksson 2011).

In the Western countries, social isolation is the social capital indicator with the greatest potential for reducing educational health inequalities in most countries, but there are exceptions. Social participation has a greater potential than social isolation for reducing educational health inequalities between the lowest and the highest educational groups in both the Netherlands and France. This suggests that these countries would most efficiently reduce inequalities in public health between the lower and higher educational groups by targeting social participation with interventions. However, when one also takes the redistribution of the social capital risk factors between the middle and high educational groups into account and all educational groups are studied simultaneously, social isolation contributes more towards equalizing educational health inequalities also in these countries. These examples are important illustrations of the fact that educational inequalities in all-cause mortality vary in magnitude between countries according to risk factors.

Marital status and living alone were the two risk factors studied that contributed least to reducing educational health inequalities in the simulated scenarios. Both risk factors reflect dimensions of the structural sub-construct of social capital. Living alone and marital status had surprisingly few green fields and an overweight of yellow and white fields indicating less than 5 percent reduction in table 1 when an equalization in exposure to the risk factors between the low and high educational groups was simulated. It seems like a redistribution of these social risk factors would only have a minor impact on educational health inequalities. The small impact of marital status and living alone on educational inequalities in health in all the populations studied is surprising when one takes into account that previous research has documented health effects from these factors when social relations have been studied in relation

to health (Halpern 2005, Huijts 2011). One possible explanation for this may be that inequalities in the exposure to these risk factors are to a lesser degree unevenly distributed among different groups in the social stratification system, and thereby to a lesser degree play a part in educational health inequalities. When we examine the risk factor prevalence for the different educational groups in different populations, this seems to be a plausible explanation. The prevalence distributions shows that it is quite common for the risk factor distribution for living alone and marital status to be higher in the highest educational group (Appendix AB tables AB 2-6). In this uncommon case where the less educated are less frequently exposed to risk factors than the more highly educated, it is assumed that the potential reduction of inequalities in mortality equals zero in the estimations.

The results show that there are clear differences between countries in how a redistribution of social risk factors will influence educational health inequalities. There are important variations between the social capital indicators treated as risk factors to health in this study. Some of the examined indicators of social capital seem to have a greater potential for reducing educational health inequalities than others do. The findings are in line with previous research which has examined variations in health inequalities according to risk factors, although the results are not directly comparable (Uphoff et al. 2013, Pichler & Wallace 2008, Rostila 2013). The results from this thesis indicate that differential access to social capital between educational groups in Europe influences the observed health inequalities. Overall, the results indicates that inequalities in all-cause mortality can potentially be reduced for both men and women through a redistribution of social risk factors by education, but in most cases their contribution is not sufficient to totally eliminate them.

6.3 Discussion of results in a sociological context

The theory of social capital has received considerable support in the existing empirical evidence, and the high importance of social relationships for human's health and well-being is widely documented (Halpern 2005, Sund 2010, Rocco & Suhrcke 2012, Blaxter 2010, Blaxter 2010). Pichler and Wallace (2008) have pointed out that despite a large well-documented knowledge base on social capital and health, empirical investigations of the role of social capital in socioeconomic health inequalities are still quite scarce in the literature. In order to tackle health inequalities, it is important to provide this kind of information so that public health policies can target the underlying causal mechanisms (Hoffman et al. 2012). Huijts (2011) has also pointed out that previous research on social capital and health has been criticized for not

taking the informal social relations into account and to a large degree using indicators measuring formal social relations when examining social capital and health. This thesis addresses both of these issues as it includes measures of both types for a wide range of populations and is therefore able to investigate the influence of formal and informal social relationships in educational inequalities on health.

Firstly, the thesis provides strong evidence to suggest that people with lower levels of education have lower levels of social capital, and that lack of social capital is related to socioeconomic inequalities in health, as an upward levelling of social capital will result in a reduction in educational health inequalities. This finding strengthens the previous studies that have suggested that differential access to social capital may influence health inequalities (Uphoff et al. 2013, Rostila 2013, Ross & Wu 1995, Pichler & Wallace 2008, More et al. 2013).

Secondly, the results from this thesis emphasize the importance of decomposing social capital, not only into the suggested sub-constructs that both showed a substantial potential for reducing educational health inequalities, but to an even more detailed level. There were large variations in the impact of the different indicators from the structural sub-construct on educational health inequalities. Cohen (2004) has previously pointed out that it is only by understanding the different dimensions of social capital in relation to health that the development of better health policies and interventions will be possible, and the findings from this thesis clearly point toward a divide in the structural sub-construct of social capital.

It seems like formal relations are of high importance when it comes to explaining the role of social capital in educational health inequalities. Insights from the initial theories on social capital and health may provide us with important guidance here. That social isolation and social participation are of high importance to health and health inequalities is not a surprising finding taking the existing literature on social capital into account, as the importance of formal networks is emphasized in both Coleman's and Putnam's theories (Coleman 1990, Putnam 2000). Social isolation to a large degree mirrors our network integration and our level of integration in society (Cohen & Wills 1985). Social isolation is here measured through participation in social activities, while social participation is measured through participation in voluntary organizations, and both indicators of social capital encapsulate the individual's formal relations. Both social isolation and social participation are measures of formal relations characterized by outreaching relations to others, or in Putnam's terms Bridging social capital (Putnam 2000).

That the formal indicators play an important part in explaining educational health inequalities are therefore not unexpected, as formal relations are thought to provide meaningful roles, valuable contacts, information about current affairs and social control in the form of norms and sanctioning behavior (Putnam 2000, Coleman 1990). Which may influence health directly and indirectly through the suggested pathways from the direct-effect model and indirectly through the stress-buffering model (Cohen & Wills 1985, Cohen 2004). At the same time, the lack of formal relations among individuals in the disadvantaged groups may restrict their opportunities to obtain and make use of social capital which may result in an inability to cope with experienced stressors and risk factors that may result in ill health and contribute to health inequalities (Uphoff et al. 2013, Cohen 2004).

Being in possession of several outreaching networks in line with the theories of Granovetter (1973) and Putnam (2000) may also be beneficial to health through the information the formal networks provide. Information is also emphasized in Coleman's (1990) theory where information is seen as one of the three types of social capital. The information channels may provide information influencing health and the more extensive interactions and higher levels of involvement found in the higher educational groups may provide the participants with better information on lifestyle, how to prevent disease, which hospitals provide the best health care etc. (Rocco & Suhrcke 2012, Huijts 2011). The higher involvement in formal networks may therefore partly explain why it seems like interventions and new health information are more beneficial to and faster taken up in the higher educational groups (Mackenbach 2006).

The informal relations in the structural sub-construct of social capital, on the other hand, seemed to be of lesser importance in educational health inequalities. Both marital status and living alone is what in Putnam's (2000) terms would be classified as bonding networks. They had relatively little impact on educational inequalities in health. The divide between the formal and informal indicators of social capital is relative clear, were the formal relations in bridging networks have the greatest potential in reducing health inequalities. This do not mean that informal relationships not are of importance to health, as previous research have proved that informal relations are of importance to health, but informal relations seem to play a smaller part in the explanation of educational health inequalities (Halpern 2005, Bø & Schiefloe 2007). This finding supports Putnam's (2000) notion that it is the formal relations in outreaching networks that let one "get ahead in life", since bridging networks contribute more varied resources that

may be beneficial and facilitate action in a wider range of situations, and suggest that this also is the case in a health sociological perspective.

That the only social capital indicator from the functional sub-construct, perception of support, also seems to have a substantial impact on educational health inequalities again strengthens the theoretical notion that social capital may influence health in a multifaceted number of ways (Cohen 2004, Eriksson 2011, Halpern 2005, Song 2009). Cohen & Willis (1985) emphasized that it is the perception of available support that is of importance for one's health, here measured as having at least one well-acquainted relation with whom one can talk about intimate matters. Social support is important for one's health as support may provide solutions and distractions from one's problems, but feelings of support can also contribute to one's self-image and the feeling of being valued by others with whom one has close relations (Cohen 2004, Halpern 2005). According to Putnam (2000) social support can be located in both bonding and bridging types of networks. In bonding networks family and friends provide support and resources, but bridging networks such as the workplace and voluntary organizations may also provide support as well as feelings of solidarity for other members that could lead to friendship (Halpern 2005). The divide between bridging and bonding networks is in no way absolute, and social relations can often have a changeable character (Rostila 2013). Perception of available social support could therefore originate in both bonding and bridging types of networks. Independently of network type, it seems like perceiving social support from at least one other person has a potential for reducing educational health inequalities, as the perception of social support may buffer stress and prevent the effects of some risk factors to health (Cohen 2004, Cohen & Willis 1985, Holt-Lundstad et al. 2010).

The facilitation of actions and access to more varied resources provided by formal relations may be a key contributor to understanding educational inequalities in health, as previous research has shown that the stratification process into the social hierarchy influences both accumulation of social capital and how people structure their social relations (Lin 1999, Pichler & Wallace 2008, OECD 2010). Ross & Wu (1995) have pointed out that the relations people participate in are to a large degree determined by their position in the social hierarchy. Previous research on how social stratification influences social capital has indicated that people in higher socioeconomic groups tends to be in possession of more outreaching networks and a higher numbers of formal relations than their counterparts (Lin 2000, Pichler & Wallace 2008). In line with the findings from previous research, it seems like people in the upper socioeconomic

groups participate in activities and organizations more frequently than people in lower socioeconomic groups, which in turn contributes to health inequalities (Lin 2000, Pichler & Wallace 2008).

Pichler & Wallace (2008) suggested in their study that the higher educational groups are embedded in a broader range of networks through their activities and organizational participation. This broader range of diverse connections may result in a higher accumulation of more diverse social capital in the upper social groups, which in turn may influence health inequalities. The differential access to capital may be a result of the fact that people in the upper social groups meet different kinds of people more often, while people in the lower social positions tend to have a smaller circle of social connections. In line with the finding of Pichler and Wallace (2008), the highly educated in this study also tend to have access to a higher number of formal relations. Knowing different kinds of people may be beneficial to health as it may help individuals in coping with different situation. Knowing similar people, on the other hand, may limit the number of situations were one could benefit from social capital. The division between formal and informal relations in access to different types of capital may be a contributing factor to social capital's influence on educational health inequalities. In line with Pichler and Wallace's (2008) study, this thesis strengthens the notion that formal connections seem to be one of the contributing factors to socioeconomic health inequalities.

In figure 2 a graphical presentation of the mediating effect of social capital on health inequalities is presented. Social capital may compensate for lacking resources, protect against exposure to risk factors or help individuals avoid risk factors in the first place. The suggested model and explanations are valuable in understanding social capital's role in health inequalities. The findings in this thesis indicate that social capital is unevenly distributed between educational groups in Europe and that the unequal access to social capital contributes to educational inequalities in health. Both sub-constructs of social capital seem to have a substantial potential for reducing educational health inequalities, but the results indicate that there is a clear divide in the health potential in the structural sub-construct between bridging and bonding types of social capital. In line with the results from previous research on social capital's role in socioeconomic health inequalities it seems like bridging formal networks are the dimensions of social capital with the greatest potential for reducing health inequalities (Pichler & Wallace 2008, Kerckhoff 2001).

6.4 Implications of findings. Placing the thesis in a larger context

The findings in this thesis have important consequences as they take the knowledge base on social capital's role in educational health inequalities a step further. Firstly, the findings are important to public health research and health sociology, as the estimations of how social capital influence educational health inequalities can be used to suggest priorities for further public health research and policy development. Secondly, the findings also have important theoretical implications for everybody with an interest in the concept of social capital and social capital's relation to health, as they provide new information on how different dimensions of social capital influence educational inequalities in health that was previously not available. Cohen (2004) has previously pointed out that it is only by understanding the different dimensions of social capital that policymakers will be able to target social relations with interventions. Theoretical progress is therefore needed in order to develop innovative health policies.

Even though different mechanisms and explanatory pathways between social factors and health are suggested in the literature, realistic measures of reducing health inequalities based on social health determinants are scarce and up until now it has been unknown to what extent social capital health determinants are modifiable (EURO-GBD-SE 2013, Hoffmann et al. 2012). The need for knowledge of which characteristics of the social environment are beneficial to health is of high importance, since the lack of knowledge about which factors in the social environment influence health hampers the development of effective policy making by hindering priority setting and quantitative realistic public health goals (Hoffmann et al. 2012, EURO-GBD-SE 2013, Cohen 2004). In a report by the OECD (2010) the need for methodological solutions to identify the mechanisms through which social capital and other social health determinants influence socioeconomic health inequalities is stressed. The upward levelling scenario strategy is well suited for examining how different dimensions of social capital influence educational health inequalities, as it offers a solution where health is not redistributed from the higher to the lower educational groups, but where instead the lower educational groups are "levelled up" (Mackenbach et al. 2007). The results present a theoretical upper limit to what it is possible to achieve in terms of reducing health inequalities by eliminating differences in social capital among social groups. By providing such estimations for a number of key social capital indicators, this thesis takes an important step in enlarging the knowledge base on social capital's role in explaining educational health inequalities.

The findings from this thesis are therefore of relevance to policymakers, as the results indicate where the potential for reducing educational inequalities in health is greatest. The results may also provide suggestions about which indicators health policies should seek to implement in future health interventions in order to reduce socioeconomic health inequalities and make good health a reality for everyone. The findings indicate that future health policies should primarily aim at targeting formal rather than informal social relations in order to reduce educational health inequalities, and also provide estimations of the contribution of individual social risk factors to educational health inequalities in a wide range of populations. That it is the formal relations that pose the greatest potential in reducing educational health inequalities may in some ways be heartening, as they are easier to target with interventions. One cannot just tell people to move together or get married, but policy makers could emphasize interventions facilitating social participation in organizations and activities increasing formal relations through policy incentives. The thesis, however, does not explain exactly which mechanisms social capital influences health through, which the OECD (2010) has pointed out as a huge limitation to social capital and health research. By providing new information that lets us understand social capitals relation to health inequalities at a more detailed level we are closer to understanding these mechanisms, but further research is needed.

The results provide considerable evidence that social capital is in fact unevenly distributed among educational groups throughout Europe, and that increasing the social capital in the lower educational groups will contribute to better population health and smaller health inequalities if the interventions succeed. The findings show important differences in entry-points between countries, and policy strategies should not be the same everywhere (EURO-GBD-SE 2013). Social capital is, however, as Islam et al. (2006) have pointed out, not a unique cure for inequalities in population health in Europe, but may partly explain some of the observed health inequalities. The persisting differences between groups in society indicate that socioeconomic health inequalities are deeply rooted in the structure of modern societies (Mackenbach 2006, EUROTHINE 2007). The persistence of health inequalities between socioeconomic groups in a wide range of European countries, also including countries with high levels of welfare and long-standing healthcare systems, calls for caution not to overestimate how much socioeconomic inequalities in health can be reduced (Mackenbach et al. 2007). The results from this thesis indicate that educational health inequalities could be substantially reduced by a redistribution of social risk factors by education, but in most cases their contribution is not

sufficient to totally eliminate them. Mackenbach et al. (2007) have pointed out that a complete elimination of health inequalities does not seem realistic.

6.4.1 Theoretical implications of findings

When it comes to theoretical implications for social capital and health inequalities, this thesis provides important nuances to the existing knowledge base. In the existing literature, social capital has been treated in a variety of ways and no shared definition or widespread operationalization has yet been developed. There is an abundance of definitions of social capital and correspondingly many ways to handle the concept. In the large theoretical frameworks of Coleman and Putnam, social capital includes almost all aspects of the social structure that facilitate social interaction (Coleman 1990, Putnam et al. 1993, Putnam 2000, Carpiano 2006). Social capital's inaccessible nature from the initial theories has been adopted into later research, which has resulted in social capital becoming a rather diffuse concept with contestable operationalization (Song 2009, Uphoff et al. 2013).

The uncertainty around the concept of social capital has received criticism in the literature, but no solution to the theoretical problems has yet been provided (OECD 2010, Rostila 2013). The term social capital has been used to describe all kinds of formal and informal reciprocal links among people at the individual, community and national level, which has led to important differences in the ways social capital has been treated and measured in the literature. Measures of trust, civic engagement, voluntariness, social networks, social support, social resources, community capacity etc., have all been labeled as examinations of social capital. That social capital is also actively used in a wide range of sciences has led to an inflation in the use of the term (Sund 2010, Halpern 2005, Carpiano 2006, Cohen 2004). The findings from this thesis provide evidence that indicators used to measure social capital should not be randomly chosen, as different indicators may measure different dimensions of social capital and influence health through different causal mechanisms. Social capital is in fact not social capital. Different dimensions function in different ways and this should be taken into consideration when one examines the concept. This is in line with Cohen's (2004) statement that we need to understand how different dimensions of social capital influence health in order to develop better health policies. This thesis is one of the most nuanced studies of social capital's role in educational health inequalities and it is clear that there are important differences between indicators of social capital when one examines the contribution of social relations to these health inequalities.

6.5 Strengths and limitations

It is necessary to point out that there are both strengths and limitations of a theoretical and methodological kind in this thesis. An important strength is that the thesis is the first to use the PAF method to examine the influence of social capital on educational health inequalities. Up until now realistic quantitative estimates of the impact of changing risk factor distributions have not been applied to indicators of social capital seen as risk factors to health. The PAF method represents a novel approach to identifying which dimensions of social capital policies should aim at in order to tackle health inequalities (Hoffman et al. 2012). The results therefore provide new information about social capital's role in explaining educational health inequalities. They also show to what extent inequalities in mortality can potentially be reduced by tackling each of the addressed social determinants, which may in turn provide guidance for future health policy development.

A methodological strength of the upward levelling strategy is that health inequalities are not reduced by a redistribution of health from the higher to the lower educational groups, but by "levelling up" health from the lower educational groups. Most analyses of opportunities for reducing health inequalities conclude that policies and interventions should aim for an "upward levelling" of health inequalities, by which the higher exposure to risk factors to health of the lower socioeconomic groups is reduced to the level seen among the more advantaged groups in society (Mackenbach et al. 2007).

The wide geographical coverage must be seen a strength of the study. The available data from 16 European nations with either full or partial coverage allow comparative examinations of the influence of different social risk factors on educational health inequalities between countries to an extent that was previously unavailable. As this thesis is the first to apply the PAF method to social capital's role in educational health inequalities, it takes the knowledge base on social capital further by providing estimations for entry-points for policies for a large number of nations.

The implementation of the PAF approach also caused several limitations that should be mentioned and that all indicate a need for future research. The use of PAF in the estimations of reduction of educational inequalities in all-cause mortality does not include any significance measures or confidence intervals to account for sampling variability and secure generalization of the estimates. This is an important limitation regarding the quality of the results. However,

the data and estimation techniques used to acquire the estimations are of high quality, and it is justified to use the results obtained as a starting point for examining the role of social capital in educational health inequalities. At the same there is no doubt that further research should calculate confidence intervals and also seek to replicate the results.

It should also be viewed as a limitation that the PAF approach only allows separate examination of the influence of the social risk factors adressed, as it would have been interesting to see their contributions to educational health inequalities combined. This is a methodological limitation, as a simultaneous examination of the risk factors would assume mutual interdependence, which could not be guaranteed in this thesis. Hoffman et al. (2012) have shown that the combined effect of two risk factors, smoking and obesity, considerably exceeded the separate effects for each risk factor. This implies that the full potential for reducing inequalities in mortality may be even greater than the estimates for the five social capital indicators which the analysis suggests (Hoffman et al. 2012).

There are also limitations related to data availability. Major harmonization efforts have been undertaken in order to be able to combine the different data sources used in this thesis, still some potential comparability problems could remain. For example, the mortality data from some countries are based on unlinked cross-sectional studies, while the prevalence data comes from self-reported measures from the European Social Survey (EURO-GBD-SE 2013).

Data availability also limited the measuring of socioeconomic position. Unfortunately, it was only possible to include one indicator of socioeconomic position in the form of educational attainment. It would be desirable to include income and/or occupational status in further analysis to examine the potential for reducing health inequalities with interventions targeting social capital at a more detailed level. Both Daly et al. (2002) and Winkelby et al. (1992) have described these three measures as the most important measures of socioeconomic position, but due to data limitations implementation of income and/or occupational class was not possible. That the estimates provided only took health inequalities in education into account and thereby ignored health inequalities in relation to other socioeconomic factors must be viewed as a limitation.

There is also a limitation related to the relative risks gathered from the meta-analysis of the effects of social factors on health. The relative risks are gathered from a large meta-analytical

review based on studies which have tried to provide quantitative estimates of causal effects of social risk factors on mortality, including control for confounding variables (Holt-Lundstad et al. 2010). The relative risks were assumed to be the same in all age and educational groups for all the populations under study. If the relative risks differ between educational groups, the results may have overestimated or underestimated the potential reduction of inequalities in all-cause mortality. The results may also have been influenced if the relative risks vary among age groups and nations (EURO-GBD-SE 2013).

That the included social capital risk factors only target some dimensions of social capital should also be seen as a limitation of the thesis. Different indicators of social capital from both the structural and the functional sub-construct of social capital as well as measures of both formal and informal relations are included. This must be seen as a strength of the thesis, but at the same time no indicators that specifically target trust or norms could be included. There is strong evidence in the literature that trust and norms are important building blocks in social capital, and trust is often used to measure social capital in the literature (Putnam 2000, Halpern 2005, Rostila 2013). The importance of including measures of trust is stressed by a study that investigated the influence of social capital on educational inequalities in health, which concluded that social and institutional trust were the dimensions of social capital that contributed the most to educational health inequalities (Rostila 2013). As Cohen (2004) stated, it is only by understanding the different dimensions of social capital that one can target social relations with interventions, and this thesis does not reflect all possible dimensions of social capital.

Despite the potential comparability and methodological limitations in this thesis, the harmonized data used have been gathered from reliable sources and represent the best data available for exploring isolated social capital indicators as risk factors to health. The limitations should be considered when interpreting the results. The greatest strength of this thesis is that it provides new information on the contribution of the addressed indicators of social capital under investigation. This information is a valuable starting point for policy development as it identifies entry-points for policies to tackle health inequalities and provides new information that may guide further research.

6.6 Suggestions for further research

Health inequalities continue to be one of the main challenges to public health (WHO 2003). In order to achieve a reduction in socioeconomic health inequalities interventions need to target the causal mechanisms causing the inequalities in the first place, and providing information that may contribute to diminishing health inequalities should be the main priority for further research (CSDH 2008). Social capital may be an important piece in the puzzle for reducing socioeconomic health inequalities, but knowledge about its role in socioeconomic health inequalities is still scarce (Pichler & Wallace 2008). By providing information about which factors in the social environment contribute the most to socioeconomic health inequalities, we provide the public health field with tools to target these causal mechanisms (EURO-GBD-SE 2013). This thesis suggests entry points for policies in different European countries and may provide important guidance for policy makers regarding how an increase in social capital among socioeconomic groups would influence health inequalities. However, this thesis only investigates some of the dimensions of social capital, and only examines socioeconomic health inequalities on the basis of the socioeconomic indicator education, and further research is needed in order to clarify the role of social capital in socioeconomic health inequalities.

Further research should also aim at including a wider range of social capital indicators such as trust and norms that have been shown to be important building blocks in social capital in PAF analysis in order to obtain a broader, more nuanced understanding of social capital's potential for reducing educational health inequalities. Research should also aim at investigating how different types of social support such as financial, instrumental and informational social support influence socioeconomic inequalities in health. This thesis only includes an estimation of emotional support through the possibility of conversations about intimate matters and does not include any measures of the possibility of receiving material and informational aid from one's social contacts, such as the possibility for borrowing money when one is in need of financial aid. Other types of support clearly constitute important factors in the functional sub-construct of social capital and should be included in addition to the estimations of emotional social support in order to get a more nuanced understanding of how social capital influences socioeconomic health inequalities.

As the estimates provided in this thesis are the first to investigate social capital's role in educational health inequalities with the PAF method the results also need to be replicated in order to ensure validity and reliability. This is particularly important as the estimates do not

include any significance or confidence intervals, which is a major limitation in this thesis. Further research should also apply other socioeconomic indicators such as income and occupational status, in order to obtain a more detailed understanding of the influence of social capital on socioeconomic health inequalities.

It should also be a priority for further research on social capital to clear up the theoretical uncertainties associated with the concept of social capital in health research (Lynch et al. 2000). It may seem arbitrary to continue the study on social capital in health research when one takes the theoretical uncertainties, the different measures and the diffuse mechanisms linking social capital and health into account. Rostila (2013) has argued that in order to be able to generate well-developed and specific models for understanding social capital's influence on health inequalities, a distinct definition of social capital that emphasizes the core of the concept is required. The value of the comprehensive view social capital provides in relation to health is clear, as it contributes to the understanding of how various aspects of social relationships separately and mutually influence health and health inequalities. Network theory lacks such a potential as it focuses exclusively on specific aspects of social relationships, but a clearer understanding of the underlying mechanisms is needed and should be a priority for further research (Rostila 2013).

Further research should also emphasize the importance of contextual contributions to socioeconomic health inequalities. As contextual factors have been shown to influence health they may also contribute to health inequalities (Rostila 2013, Halpern 2005). Since the social stratification process of individuals into different positions in society associated with different exposures to risk factors and goods is to a large degree the cause of health inequalities, change cannot be expected to come from the individuals alone (Mackenbach et al. 2007, Pichler & Wallace 2008). It is therefore important to figure out how one should approach contextual determinants that influence the access to social capital and health inequalities and how these contextual factors affect individual health determinants in order to develop efficient policies. Providing this kind of information should be one of the main priorities for reducing health inequalities in society and further research should put emphasis on revealing such contextual contributions (Sund 2010, Wilkinson 2005).

The suggestions for further research are substantial, and some of the issues addressed in this section will require both theoretical development and methodological advances. Solutions to

these issues will, however, contribute to a massive extension of today's knowledge base and will most likely lead to the development of innovative interventions in public health and contribute to diminishing socioeconomic health inequalities in Europe.

7. Conclusion

Socioeconomic inequalities in health continue to be one of the main challenges to public health in the 21st century (WHO 2003). The insight that social relationships influence health is in no way new, but the knowledge base concerning how specific social risk factors contribute to health inequalities is currently not well understood (Hoffman et al. 2012). The role of social capital in explaining health differences has often been neglected in the literature (Pichler & Wallace 2008). This thesis addresses this limitation in the literature and takes the knowledge base on social capital's role in explaining socioeconomic inequalities in health one-step further, by providing straightforward quantitative estimations for the influence of several indicators of social capital on educational inequalities in all-cause mortality. This thesis is one of the most nuanced studies of social capital's role in educational health inequalities. Providing this type of empirical evidence linking social capital to health inequalities is important in order to be able to develop better health policies and interventions aimed at reducing health inequalities in society (Cohen 2004, OECD 2010).

This thesis provides strong evidence that people with lower levels of education have lower levels of social capital, and that lack of social capital is related to socioeconomic inequalities in health. The applied PAF method is well suited to identifying the factors that should be different countries' main priorities for public health development. Both the functional and the structural sub-constructs of social capital seem to be of importance, but in the structural sub-construct there was a clear divide between measures of formal and informal relations. Bridging formal relations seem to be of higher importance in explaining educational health inequalities than informal bonding relations. Social isolation was the social capital indicator with the greatest potential for reducing educational health inequalities in Europe, even though entry points varied between genders and European nations. Social isolation was followed by social participation and perception of social support. These three factors should be considered in future policy development in order to obtain the highest possible level of population health. The informal social capital indicators marital status and living alone seemed to be of lesser importance in explaining educational inequalities in health.

That the estimated influence of the different social capital indicators varies between countries indicates that each country needs its own adjusted strategy in order to tackle educational health inequalities (EURO-GBD-SE 2013). The results from this thesis could be used to identify

different countries main priorities for which dimension of social capital public health should target to achieve the greatest possible reduction in educational health inequalities. The findings indicate that an increase in social capital in the lower educational groups would diminish the health gap between educational groups through Europe, and this thesis takes an important step in the mapping of health inequalities.

It may seem that Putnam was right when he stated that it is a toss-up statistically if one should stop smoking or start joining (Putnam 2000). The findings in this thesis cannot confirm this statement, but evidence from the literature and this thesis indicates that social capital has a considerable influence on health inequalities. This suggests that policymakers, health professionals and the public media should take social capital and social risk factors as seriously as other risk factors to health, such as smoking, physical activity, exercise and lifestyle (Holt-Lundstad et al. 2010).

That it is the formal relations that pose the greatest potential in reducing educational health inequalities may in some ways be heartening, as they are easier to target with interventions. One cannot just tell people to move together or get married, but policy makers could emphasize interventions facilitating structural change in order to raise social participation in organizations and activities through policy incentives. Such interventions will not only contribute to enhanced life quality and better public health, but may in fact also enhance survival.

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Appendices

Appendix A. Sources of relative risks, initial rate ratios and mortality data

Table A1: Sources of prevalences[1]

Country	Years	N
Austria	ESS round 2002 and 2004	4513
Belgium	ESS round 2002 and 2004	3677
Czech Republic	ESS round 2002 and 2004	4386
Denmark	ESS round 2002 and 2004	2993
United Kingdom	ESS round 2002 and 2004	3949
Estonia	ESS round 2004	1989
Finland	ESS round 2002 and 2004	4022
France	ESS round 2002 and 2004	3309
Italy	ESS round 2002 and 2004	2736
Netherlands	ESS round 2002 and 2004	4245
Norway	ESS round 2002 and 2004	3796
Poland	ESS round 2002 and 2004	3826
Spain	ESS round 2002 and 2004	3392
Sweden	ESS round 2002 and 2004	3947
Switzerland	ESS round 2002 and 2004	4180

[1] All prevalence data on social capital indicators stem from the first and second round of the European Social Survey.

Table A2: Characteristics of the mortality data

Population	Type of dataset	Period	Geographic coverage	Demographic coverage
Finland	Longitudinal	2001–2007	national	20% of Finns are excluded (at random)
Sweden	Longitudinal	2001–2006	national	whole population
Norway	longitudinal	2001–2006	national	whole population
Denmark	Longitudinal	2001–2005	national	whole population
England & Wales	longitudinal	2001–2006	national	1% of the population
Scotland	Longitudinal	2001–2006	national	5.3% representative sample of the population
Netherlands	longitudinal	1998–2003, 1999–2004, 2000–2005, 2001–2006, 2002–2007	national	linkage based on the labour force survey
Belgium	Longitudinal	2001–2005	national	whole population
France	longitudinal	1999–2005	national	1% of the population, born outside France mainland excluded
Switzerland	Longitudinal	2001–2005	national	Non-Swiss nationals excluded
Austria	longitudinal	2001–2002	national	whole population
Barcelona	cross-sectional linked	2000–2006	city	whole population
Basque Country	longitudinal	2001–2006	region	whole population
Madrid	cross-sectional linked	2001–2003	region	whole population
Turin	longitudinal	2001–2006	city	whole population
Tuscany	Longitudinal	2001–2005	Florence, Leghorn, Prato	whole population
Hungary	cross-sectional unlinked	1999–2002	national	whole population
Czech Republic	cross-sectional unlinked	1999–2003	national	whole population
Poland	cross-sectional unlinked	2001–2003	national	whole population
Lithuania	Longitudinal	2001–2005	national	whole population
Estonia	cross-sectional unlinked	1998–2002	national	whole population

The mortality data used in this thesis are obtained by the EURO-GBD-SE project.

Table A3: Initial rate ratios for the association between education and all-cause mortality[1].

		MEN					WOMEN				
		age 30-44	age 45-59	age 60-69	age 70-79	All Ages	age 30-44	age 45-59	age 60-69	age 70-79	All ages
Finland	Low	4.27	2.35	1.82	1.55	2.20	3.49	2.05	1.59	1.50	1.61
	Mid	2.27	1.76	1.50	1.26	1.62	1.69	1.32	1.25	1.22	1.26
Sweden	Low	3.40	2.25	1.75	1.54	1.76	2.68	2.11	1.86	1.58	1.82
	Mid	1.90	1.68	1.39	1.26	1.37	1.49	1.45	1.42	1.27	1.36
Norway	Low	3.95	2.79	2.15	1.72	2.10	3.01	2.40	1.97	1.65	1.94
	Mid	2.05	1.78	1.52	1.32	1.48	1.77	1.44	1.39	1.22	1.32
Denmark	Low	3.93	2.37	1.69	1.45	1.71	2.73	1.98	1.74	1.41	1.66
	Mid	1.99	1.63	1.41	1.32	1.39	1.35	1.36	1.31	1.19	1.28
England & Wales	Low	1.95	2.12	1.59	1.56	1.69	1.80	1.37	1.77	1.63	1.62
	Mid	1.62	1.54	1.16	1.13	1.23	0.98	0.88	1.24	1.16	1.10
Scotland	Low	4.63	2.55	1.78	1.78	2.03	3.41	1.94	1.95	1.80	1.95
	Mid	2.71	1.54	1.40	1.35	1.45	1.18	1.13	1.20	1.23	1.19
Netherlands	Low	2.03	1.93	1.60	1.83	1.79	1.87	1.67	1.72	1.34	1.54
	Mid	1.32	1.24	1.28	1.43	1.34	1.05	1.24	1.28	0.97	1.11
Belgium	Low	2.62	1.92	1.75	1.55	1.85	2.00	1.56	1.56	1.55	1.61
	Mid	1.73	1.40	1.35	1.22	1.45	1.37	1.27	1.30	1.20	1.30
France	Low	3.73	2.49	1.91	2.04	2.20	3.17	1.90	1.46	1.35	1.61
	Mid	2.36	1.86	1.39	1.56	1.62	1.90	1.45	1.16	1.14	1.26
Switzerland	Low	3.77	2.64	2.12	1.69	2.04	2.52	1.63	1.36	1.48	1.53
	Mid	1.91	1.64	1.47	1.27	1.43	1.24	1.12	1.06	1.17	1.13
Austria	Low	2.90	2.39	1.86	1.53	1.86	2.27	1.65	1.32	1.48	1.51
	Mid	1.79	1.88	1.51	1.27	1.49	1.43	1.29	1.10	1.18	1.19
Barcelona	Low	4.24	1.81	1.40	1.29	1.54	2.80	1.22	1.22	1.32	1.35
	Mid	1.89	1.30	1.10	1.08	1.16	1.35	1.01	1.09	1.07	1.08
Basque C	Low	3.19	1.66	1.27	1.19	1.40	2.40	1.28	0.96	1.18	1.20
	Mid	1.62	1.20	1.15	1.03	1.12	1.61	1.16	0.91	1.04	1.06
Madrid	Low	3.09	1.76	1.31	1.20	1.42	1.89	1.04	1.33	1.30	1.27
	Mid	1.63	1.39	1.24	1.10	1.22	1.60	1.02	1.37	1.20	1.22
Turin	Low	2.93	1.64	1.81	1.31	1.56	2.06	1.34	1.05	1.04	1.14
	Mid	1.38	1.17	1.23	1.08	1.15	1.36	1.26	0.98	1.01	1.06
Tuscany	Low	4.79	2.18	1.59	1.36	1.64	2.13	1.34	1.32	1.14	1.28
	Mid	2.07	1.45	1.25	1.10	1.22	1.60	1.16	1.07	0.99	1.08
Hungary	Low	6.83	4.81	2.50	1.92	2.99	4.25	2.45	1.55	1.26	1.69
	Mid	3.00	1.79	1.40	1.12	1.45	2.04	1.46	0.98	0.81	1.03
Czech R	Low	3.75	3.62	2.95	2.40	2.86	2.71	2.49	2.22	2.01	2.29
	Mid	1.69	1.81	1.57	1.36	1.53	1.47	1.55	1.65	1.60	1.62
Poland	Low	7.95	3.68	2.42	2.01	2.79	5.00	2.22	2.00	1.69	2.03
	Mid	3.04	2.43	2.13	1.80	2.10	2.03	1.84	1.73	1.42	1.62
Estonia	Low	6.71	3.24	2.15	1.61	2.48	6.84	3.12	2.02	1.57	2.31
	Mid	3.17	2.34	1.82	1.46	1.89	2.14	1.91	1.63	1.41	1.62

1. The initial rate ratios for mortality are estimated from the combined dataset used in the analysis.

Table A4: Relative risks for the impact of risk factors on all-cause mortality

	MEN				WOMEN			
	age 30-44	age 45-59	age 60-69	age 70-79	age 30-44	age 45-59	age 60-69	age 70-79
Social Isolation								
Isolated	1.40	1.40	1.40	1.40	1.40	1.40	1.40	1.40
Not isolated	1	1	1	1	1	1	1	1
Marital status								
Not married	1.33	1.33	1.33	1.33	1.33	1.33	1.33	1.33
Married	1	1	1	1	1	1	1	1
Social participation								
No participation	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Participation	1	1	1	1	1	1	1	1
Living alone								
Living alone	1.19	1.19	1.19	1.19	1.19	1.19	1.19	1.19
Living with others	1	1	1	1	1	1	1	1
Perception of social support								
Non or little support	1.35	1.35	1.35	1.35	1.35	1.35	1.35	1.35
Support	1	1	1	1	1	1	1	1

Sources: The relative risks are gathered from the Holt-Lundstad et at. (2010) meta-study

Appendix AB. Prevalence for social capital indicators

Table AB 1: Prevalence of perception of social support

		Men				Women			
	age	30-44	45-59	60-69	70-79	30-44	45-59	60-69	70-79
Education	**Perception of social support**	**AUSTRIA**							
Low	Support	0,918	0,818	0,783	0,783	0,934	0,821	0,765	0,760
	Non or little support	0,082	0,182	0,217	0,217	0,066	0,179	0,235	0,240
Middle	Support	0,960	0,918	0,953	0,857	0,946	0,928	0,927	0,850
	Non or little support	0,400	0,082	0,047	0,143	0,054	0,072	0,073	0,150
High	Support	0,918	0,938	0,962	0,933	0,982	0,932	0,857	1,000
	Non or little support	0,082	0,063	0,038	0,067	0,018	0,068	0,143	0,000
		BASQUE COUNTRY. MADRID AND BARCELONA (SPANISH DATA APPLIED)							
Low	Support	0,883	0,947	0,812	0,820	0,964	0,919	0,831	0,772
	Non or little support	0,117	0,053	0,188	0,180	0,036	0,081	0,169	0,228
Middle	Support	0,975	0,932	1,000	0,917	0,980	0,935	0,909	1,000
	Non or little support	0,025	0,068	0,000	0,083	0,020	0,065	0,091	0,000
High	Support	0,980	0,921	1,000	0,938	0,958	0,957	1,000	1,000
	Non or little support	0,020	0,079	0,000	0,063	0,042	0,043	0,000	0,000
		BELGIUM							
Low	Support	0,804	0,808	0,782	0,784	0,897	0,822	0,777	0,804
	Non or little support	0,196	0,192	0,218	0,216	0,103	0,178	0,223	0,196
Middle	Support	0,878	0,873	0,771	0,714	0,915	0,886	0,900	0,971
	Non or little support	0,122	0,127	0,229	0,286	0,085	0,114	0,100	0,029
High	Support	0,977	0,921	0,939	0,724	0,938	0,914	0,786	0,786
	Non or little support	0,023	0,079	0,061	0,276	0,062	0,086	0,214	0,214
		CZECH REPUBLIC							
Low	Support	0,800	0,759	0,692	0,667	0,805	0,764	0,722	0,592
	Non or little support	0,200	0,241	0,308	0,333	0,195	0,236	0,278	0,408
Middle	Support	0,855	0,865	0,808	0,778	0,880	0,827	0,758	0,718
	Non or little support	0,145	0,135	0,192	0,222	0,120	0,173	0,242	0,282
High	Support	0,969	0,909	0,950	1,000	0,930	0,945	0,893	1,000
	Non or little support	0,031	0,091	0,050	0,000	0,070	0,055	0,107	0,000
		DENMARK							
Low	Support	0,958	0,952	0,761	0,857	0,979	0,932	0,857	0,842
	Non or little support	0,042	0,048	0,239	0,143	0,021	0,068	0,143	0,158
Middle	Support	0,967	0,885	0,833	0,850	0,966	0,951	0,902	0,846
	Non or little support	0,033	0,115	0,167	0,150	0,034	0,049	0,098	0,154
High	Support	0,979	0,951	0,900	1,000	1,000	1,000	1,000	0,909
	Non or little support	0,021	0,049	0,100	0,000	0,000	0,000	0,000	0,091
		ENGLAND AND WALES. SCOTLAND (UNITED KINGDOM DATA APPLIED)							
Low	Support	0,911	0,893	0,882	0,854	0,936	0,911	0,913	0,925
	Non or little support	0,089	0,107	0,118	0,146	0,064	0,089	0,087	0,075
Middle	Support	0,963	0,878	0,818	0,900	0,990	0,934	0,875	0,875
	Non or little support	0,037	0,122	0,182	0,100	0,010	0,066	0,143	0,125

High	Support	0,932	0,956	0,857	0,941	0,978	0,960	0,944	0,826
	Non or little support	0,068	0,044	0,143	0,059	0,022	0,040	0,056	0,174
	ESTONIA								
Low	Support	0,846	0,818	0,781	0,923	0,667	0,815	0,773	0,756
	Non or little support	0,154	0,182	0,219	0,077	0,333	0,815	0,227	0,244
Middle	Support	0,841	0,830	0,724	0,800	0,892	0,840	0,758	0,804
	Non or little support	0,159	0,170	0,276	0,200	0,108	0,160	0,242	0,196
High	Support	0,906	0,821	0,882	1,000	0,924	0,882	0,848	0,800
	Non or little support	0,094	0,179	0,118	0,000	0,076	0,118	0,152	0,200
	FINLAND								
Low	Support	0,871	0,839	0,843	0,786	0,889	0,893	0,915	0,854
	Non or little support	0,129	0,161	0,157	0,214	0,111	0,107	0,085	0,146
Middle	Support	0,933	0,880	0,776	0,833	0,979	0,918	0,933	0,897
	Non or little support	0,067	0,120	0,224	0,167	0,021	0,082	0,067	0,103
High	Support	0,893	0,916	0,882	0,857	0,980	0,977	0,947	0,750
	Non or little support	0,107	0,084	0,118	0,143	0,020	0,023	0,053	0,250
	FRANCE								
Low	Support	0,833	0,836	0,842	0,842	0,909	0,883	0,806	0,765
	Non or little support	0,167	0,164	0,158	0,158	0,091	0,117	0,194	0,235
Middle	Support	0,895	0,871	0,844	0,750	0,930	0,879	0,857	0,758
	Non or little support	0,105	0,129	0,156	0,250	0,070	0,121	0,143	0,242
High	Support	0,959	0,895	0,933	0,818	0,923	0,879	0,905	0,889
	Non or little support	0,041	0,105	0,067	0,182	0,077	0,121	0,095	0,111
	HUNGARY								
Low	Support	0,932	0,927	0,811	0,863	0,889	0,904	0,869	0,902
	Non or little support	0,068	0,073	0,189	0,137	0,111	0,096	0,131	0,098
Middle	Support	0,909	0,933	0,833	0,918	0,959	0,885	0,920	0,950
	Non or little support	0,091	0,067	0,167	0,082	0,041	0,115	0,080	0,050
High	Support	0,962	0,971	0,833	0,958	0,969	0,917	0,900	0,889
	Non or little support	0,038	0,029	0,167	0,042	0,031	0,083	0,100	0,111
	NETHERLANDS								
Low	Support	0,904	0,892	0,919	0,816	0,957	0,934	0,856	0,902
	Non or little support	0,096	0,108	0,081	0,184	0,043	0,066	0,144	0,098
Middle	Support	0,968	0,969	0,897	0,875	0,988	0,970	0,902	0,875
	Non or little support	0,032	0,031	0,103	0,125	0,012	0,030	0,098	0,125
High	Support	0,977	0,956	0,953	0,861	0,995	0,969	0,975	0,737
	Non or little support	0,023	0,044	0,047	0,139	0,005	0,031	0,025	0,263
	NORWAY								
Low	Support	0,962	0,910	0,902	0,907	0,975	0,936	0,938	0,870
	Non or little support	0,038	0,090	0,098	0,093	0,025	0,064	0,063	0,130
Middle	Support	0,976	0,949	0,902	0,938	0,985	0,979	0,963	0,909
	Non or little support	0,024	0,051	0,098	0,063	0,015	0,021	0,037	0,091
High	Support	0,966	0,962	1,000	0,824	0,996	0,966	0,925	0,947
	Non or little support	0,034	0,038	0,000	0,176	0,004	0,034	0,075	0,053
	POLAND								
Low	Support	0,804	0,865	0,773	0,791	0,854	0,782	0,837	0,746

	Non or little support	0,196	0,135	0,227	0,209	0,146	0,218	0,163	0,254
Middle	Support	0,896	0,848	0,817	0,846	0,909	0,886	0,866	0,750
	Non or little support	0,104	0,152	0,183	0,154	0,091	0,114	0,134	0,250
High	Support	0,931	0,843	0,882	0,750	0,974	0,975	1,000	1,000
	Non or little support	0,069	0,157	0,118	0,250	0,026	0,043	0,000	0,000
SWEDEN									
Low	Support	0,887	0,881	0,832	0,767	0,925	0,914	0,912	0,886
	Non or little support	0,113	0,119	0,168	0,233	0,075	0,086	0,088	0,114
Middle	Support	0,933	0,911	0,848	0,897	0,952	0,959	0,978	1,000
	Non or little support	0,670	0,089	0,152	0,103	0,048	0,041	0,022	0,000
High	Support	0,957	0,908	0,902	0,882	0,977	0,976	0,983	0,850
	Non or little support	0,043	0,092	0,098	0,118	0,023	0,024	0,017	0,150
SWITZERLAND									
Low	Support	0,977	0,913	0,850	0,861	0,919	0,964	0,837	0,900
	Non or little support	0,023	0,087	0,150	0,139	0,081	0,036	0,163	0,100
Middle	Support	0,985	0,965	0,933	0,927	0,984	0,958	0,958	0,960
	Non or little support	0,015	0,035	0,067	0,073	0,016	0,042	0,042	0,040
High	Support	0,989	0,984	0,941	0,917	1,000	1,000	1,000	1,000
	Non or little support	0,011	0,016	0,059	0,083	0,000	0,000	0,000	0,000
TURIN AND TUSCANY (ITALIAN DATA APPLIED)									
Low	Support	0,692	0,684	0,616	0,570	0,855	0,825	0,716	0,607
	Non or little support	0,308	0,316	0,384	0,430	0,145	0,175	0,284	0,393
Middle	Support	0,867	0,765	0,784	0,789	0,897	0,792	0,750	0,643
	Non or little support	0,133	0,235	0,216	0,211	0,103	0,208	0,250	0,357
High	Support	0,885	0,848	0,545	0,583	0,945	0,939	0,917	0,800
	Non or little support	0,115	0,152	0,455	0,417	0,055	0,061	0,083	0,200

Perception of available support classified as ‘non or little support’ (no one to discuss intimate personal matters with) and ‘Support’ (Someone to discuss intimate personal matters with).

Table AB 2: Prevalence of marital status.

		Men				Women			
	age	30-44	45-59	60-69	70-79	30-44	45-59	60-69	70-79
Education	**Marital status**	**AUSTRIA**							
Low	Married	0,610	0,782	0,746	0,771	0,748	0,822	0,596	0,408
	Not	0,390	0,218	0,254	0,229	0,252	0,178	0,404	0,592
Middle	Married	0,661	0,859	0,854	0,780	0,719	0,759	0,625	0,415
	Not	0,339	0,141	0,146	0,220	0,281	0,241	0,375	0,585
High	Married	0,507	0,794	0,808	0,667	0,640	0,681	0,714	0,200
	Not	0,493	0,206	0,192	0,333	0,360	0,319	0,286	0,800
		BASQUE COUNTRY. MADRID AND BARCELONA (SPANISH DATA APPLIED)							
Low	Married	0,596	0,824	0,859	0,824	0,807	0,853	0,745	0,569
	Not	0,404	0,176	0,141	0,176	0,193	0,147	0,255	0,431
Middle	Married	0,658	0,880	0,917	0,818	0,797	0,661	0,727	0,250
	Not	0,342	0,120	0,083	0,182	0,203	0,339	0,273	0,750
High	Married	0,720	0,841	0,857	0,813	0,590	0,723	0,600	0,286
	Not	0,280	0,159	0,143	0,188	0,410	0,277	0,400	0,714
		BELGIUM							
Low	Married	0,583	0,715	0,882	0,676	0,598	0,655	0,663	0,467
	Not	0,417	0,285	0,118	0,324	0,402	0,345	0,337	0,533
Middle	Married	0,548	0,765	0,786	0,686	0,574	0,699	0,780	0,471
	Not	0,452	0,235	0,214	0,314	0,426	0,301	0,220	0,529
High	Married	0,642	0,781	0,837	0,897	0,680	0,695	0,690	0,643
	Not	0,358	0,219	0,163	0,103	0,320	0,305	0,310	0,357
		CZECH REPUBLIC							
Low	Married	0,381	0,613	0,536	0,706	0,575	0,621	0,587	0,266
	Not	0,619	0,387	0,464	0,294	0,425	0,379	0,413	0,734
Middle	Married	0,754	0,806	0,770	0,729	0,761	0,690	0,647	0,400
	Not	0,241	0,194	0,230	0,271	0,239	0,310	0,353	0,600
High	Married	0,815	0,797	0,864	0,778	0,724	0,643	0,733	0,667
	Not	0,185	0,203	0,136	0,222	0,276	0,357	0,267	0,333
		DENMARK							
Low	Married	0,521	0,569	0,739	0,743	0,596	0,632	0,600	0,586
	Not	0,479	0,431	0,261	0,257	0,404	0,368	0,400	0,414
Middle	Married	0,553	0,701	0,876	0,852	0,598	0,712	0,695	0,434
	Not	0,447	0,299	0,124	0,148	0,402	0,288	0,305	0,566
High	Married	0,660	0,825	0,824	0,632	0,678	0,667	0,759	0,364
	Not	0,340	0,175	0,176	0,368	0,322	0,333	0,241	0,636
		ENGLAND AND WALES. SCOTLAND (UNITED KINGDOM DATA APPLIED)							
Low	Married	0,532	0,758	0,774	0,679	0,586	0,703	0,628	0,418
	Not	0,468	0,242	0,226	0,321	0,414	0,297	0,372	0,582
Middle	Married	0,598	0,634	0,864	0,800	0,676	0,783	0,571	0,429
	Not	0,402	0,366	0,136	0,200	0,324	0,217	0,429	0,571

High	Married	0,600	0,788	0,828	0,829	0,632	0,728	0,694	0,625
	Not	0,400	0,213	0,172	0,171	0,368	0,272	0,306	0,375
ESTONIA									
Low	Married	0,308	0,545	0,719	0,667	0,417	0,407	0,523	0,293
	Not	0,692	0,455	0,281	0,333	0,583	0,593	0,477	0,707
Middle	Married	0,485	0,649	0,672	0,714	0,536	0,550	0,440	0,226
	Not	0,515	0,351	0,328	0,286	0,464	0,450	0,560	0,774
High	Married	0,697	0,825	0,944	1,000	0,576	0,557	0,576	0,267
	Not	0,303	0,175	0,056	0,000	0,424	0,443	0,424	0,733
FINLAND									
Low	Married	0,500	0,615	0,687	0,673	0,426	0,667	0,588	0,458
	Not	0,500	0,385	0,313	0,327	0,574	0,333	0,412	0,542
Middle	Married	0,513	0,669	0,724	0,867	0,556	0,620	0,683	0,448
	Not	0,487	0,331	0,276	0,133	0,444	0,380	0,317	0,552
High	Married	0,686	0,821	0,863	0,810	0,627	0,671	0,667	0,313
	Not	0,314	0,179	0,137	0,190	0,373	0,329	0,333	0,688
FRANCE									
Low	Married	0,650	0,776	0,802	0,840	0,664	0,760	0,670	0,549
	Not	0,350	0,224	0,198	0,160	0,336	0,240	0,330	0,451
Middle	Married	0,581	0,790	0,803	0,822	0,662	0,730	0,633	0,563
	Not	0,419	0,210	0,197	0,178	0,338	0,270	0,367	0,438
High	Married	0,628	0,800	0,851	0,727	0,637	0,718	0,727	0,333
	Not	0,372	0,200	0,149	0,273	0,363	0,282	0,273	0,667
HUNGARY									
Low	Married	0,512	0,679	0,623	0,765	0,683	0,672	0,509	0,386
	Not	0,488	0,321	0,377	0,235	0,317	0,328	0,491	0,614
Middle	Married	0,697	0,787	0,810	0,867	0,687	0,628	0,616	0,367
	Not	0,303	0,213	0,190	0,133	0,313	0,372	0,384	0,633
High	Married	0,778	0,882	0,733	0,958	0,747	0,611	0,516	0,000
	Not	0,222	0,118	0,267	0,042	0,253	0,389	0,484	1,000
NETHERLANDS									
Low	Married	0,701	0,825	0,854	0,852	0,772	0,803	0,674	0,460
	Not	0,299	0,175	0,146	0,148	0,228	0,197	0,326	0,540
Middle	Married	0,683	0,827	0,780	0,840	0,744	0,812	0,667	0,500
	Not	0,317	0,173	0,220	0,160	0,256	0,188	0,333	0,500
High	Married	0,680	0,781	0,872	0,889	0,618	0,674	0,700	0,526
	Not	0,320	0,219	0,128	0,111	0,382	0,326	0,300	0,474
NORWAY									
Low	Married	0,462	0,640	0,705	0,721	0,450	0,691	0,656	0,397
	Not	0,538	0,360	0,295	0,279	0,550	0,309	0,344	0,603
Middle	Married	0,497	0,730	0,775	0,750	0,508	0,732	0,667	0,467
	Not	0,503	0,270	0,225	0,250	0,492	0,268	0,333	0,533
High	Married	0,552	0,823	0,825	0,824	0,555	0,693	0,600	0,474
	Not	0,448	0,177	0,175	0,176	0,445	0,307	0,400	0,526
POLAND									
Low	Married	0,608	0,660	0,756	0,676	0,810	0,741	0,598	0,281

	Not	0,392	0,340	0,244	0,324	0,190	0,259	0,402	0,719
Middle	Married	0,815	0,839	0,821	0,718	0,882	0,749	0,500	0,375
	Not	0,185	0,161	0,179	0,282	0,118	0,251	0,500	0,625
High	Married	0,754	0,882	0,882	0,727	0,842	0,792	0,429	0,333
	Not	0,246	0,118	0,118	0,273	0,158	0,208	0,571	0,667
SWEDEN									
Low	Married	0,324	0,573	0,710	0,658	0,350	0,695	0,618	0,530
	Not	0,676	0,427	0,290	0,342	0,650	0,305	0,382	0,470
Middle	Married	0,411	0,655	0,712	0,690	0,472	0,644	0,761	0,667
	Not	0,589	0,345	0,288	0,310	0,528	0,356	0,239	0,333
High	Married	0,482	0,658	0,784	0,588	0,483	0,607	0,550	0,450
	Not	0,518	0,342	0,216	0,412	0,517	0,393	0,450	0,550
SWITZERLAND									
Low	Married	0,586	0,779	0,725	0,778	0,747	0,730	0,663	0,522
	Not	0,432	0,221	0,275	0,222	0,253	0,270	0,337	0,478
Middle	Married	0,706	0,761	0,841	0,823	0,722	0,736	0,657	0,500
	Not	0,294	0,239	0,159	0,177	0,278	0,264	0,343	0,500
High	Married	0,613	0,774	0,657	0,917	0,646	0,625	0,625	0,333
	Not	0,387	0,226	0,343	0,083	0,354	0,375	0,375	0,667
TURIN AND TUSCANY (ITALIAN DATA APPLIED)									
Low	Married	0,632	0,806	0,850	0,841	0,814	0,830	0,754	0,527
	Not	0,368	0,194	0,150	0,159	0,186	0,170	0,246	0,473
Middle	Married	0,625	0,824	0,820	0,789	0,788	0,733	0,720	0,571
	Not	0,375	0,176	0,180	0,211	0,212	0,267	0,280	0,429
High	Married	0,365	0,830	0,864	0,667	0,600	0,697	0,727	0,200
	Not	0,635	0,170	0,136	0,333	0,400	0,303	0,273	0,800

Marital status classified as ‘not married’ (Separated, divorced, widowed, never married, refusal, don’t know, etc.) and ‘Married’ (Married).

Table AB 3: Prevalence of social isolation

		Men				Women			
	age	30-44	45-59	60-69	70-79	30-44	45-59	60-69	70-79
Education	**Social isolation**	**AUSTRIA**							
Low	Not isolated	0,694	0,493	0,574	0,468	0,544	0,548	0,456	0,441
	Isolated	0,306	0,507	0,426	0,532	0,456	0,452	0,544	0,559
Middle	Not isolated	0,743	0,683	0,753	0,490	0,670	0,646	0,554	0,750
	Isolated	0,257	0,317	0,247	0,520	0,330	0,354	0,446	0,250
High	Not isolated	0,625	0,706	0,731	0,667	0,688	0,671	0,571	0,800
	Isolated	0,375	0,294	0,267	0,333	0,312	0,329	0,429	0,200
		BASQUE COUNTRY. MADRID AND BARCELONA (SPANISH DATA APPLIED)							
Low	Not isolated	0,609	0,610	0,606	0,563	0,618	0,551	0,533	0,446
	Isolated	0,391	0,390	0,394	0,438	0,382	0,449	0,467	0,554
Middle	Not isolated	0,656	0,625	0,667	0,417	0,691	0,623	0,636	0,625
	Isolated	0,344	0,375	0,333	0,583	0,309	0,377	0,364	0,375
High	Not isolated	0,701	0,836	0,714	0,529	0,702	0,804	0,444	0,600
	Isolated	0,299	0,164	0,286	0,471	0,298	0,196	0,556	0,400
		BELGIUM							
Low	Not isolated	0,449	0,440	0,392	0,514	0,460	0,427	0,359	0,396
	Isolated	0,551	0,560	0,608	0,486	0,540	0,573	0,641	0,604
Middle	Not isolated	0,588	0,578	0,500	0,457	0,508	0,500	0,620	0,382
	Isolated	0,412	0,422	0,500	0,543	0,492	0,500	0,380	0,618
High	Not isolated	0,688	0,664	0,510	0,690	0,637	0,683	0,571	0,643
	Isolated	0,313	0,336	0,490	0,310	0,363	0,317	0,429	0,357
		CZECH REPUBLIC							
Low	Not isolated	0,842	0,621	0,296	0,516	0,450	0,472	0,521	0,365
	Isolated	0,158	0,379	0,704	0,484	0,550	0,528	0,479	0,635
Middle	Not isolated	0,661	0,637	0,653	0,622	0,615	0,522	0,574	0,520
	Isolated	0,339	0,363	0,347	0,378	0,385	0,478	0,426	0,480
High	Not isolated	0,726	0,475	0,727	0,667	0,709	0,774	0,621	0,750
	Isolated	0,274	0,525	0,273	0,333	0,291	0,226	0,379	0,250
		DENMARK							
Low	Not isolated	0,702	0,625	0,578	0,543	0,609	0,671	0,522	0,655
	Isolated	0,298	0,375	0,422	0,457	0,391	0,329	0,478	0,345
Middle	Not isolated	0,750	0,695	0,592	0,550	0,747	0,826	0,728	0,642
	Isolated	0,250	0,305	0,408	0,450	0,253	0,174	0,272	0,358
High	Not isolated	0,753	0,748	0,620	0,737	0,913	0,853	0,828	0,636
	Isolated	0,247	0,252	0,380	0,263	0,087	0,147	0,172	0,364
		ENGLAND AND WALES. SCOTLAND (UNITED KINGDOM DATA APPLIED)							
Low	Not isolated	0,579	0,602	0,523	0,496	0,520	0,576	0,612	0,561
	Isolated	0,421	0,398	0,477	0,504	0,480	0,424	0,388	0,439
Middle	Not isolated	0,622	0,561	0,773	0,556	0,627	0,617	0,714	0,875
	Isolated	0,378	0,439	0,227	0,444	0,373	0,383	0,286	0,125
High	Not isolated	0,634	0,565	0,690	0,706	0,582	0,699	0,833	0,696
	Isolated	0,366	0,435	0,310	0,294	0,418	0,301	0,167	0,304

ESTONIA									
Low	Not isolated	0,538	0,136	0,300	0,200	0,273	0,259	0,275	0,282
	Isolated	0,462	0,864	0,700	0,800	0,727	0,741	0,725	0,718
Middle	Not isolated	0,500	0,486	0,310	0,235	0,482	0,436	0,418	0,269
	Isolated	0,500	0,517	0,690	0,765	0,518	0,564	0,582	0,731
High	Not isolated	0,758	0,513	0,588	0,333	0,723	0,667	0,545	0,600
	Isolated	0,242	0,487	0,412	0,667	0,277	0,333	0,455	0,400
FINLAND									
Low	Not isolated	0,476	0,460	0,496	0,425	0,481	0,491	0,442	0,460
	Isolated	0,524	0,540	0,504	0,575	0,519	0,509	0,558	0,540
Middle	Not isolated	0,622	0,526	0,667	0,633	0,606	0,588	0,700	0,690
	Isolated	0,378	0,474	0,333	0,367	0,394	0,412	0,300	0,310
High	Not isolated	0,654	0,646	0,667	0,571	0,725	0,730	0,684	0,875
	Isolated	0,346	0,354	0,333	0,429	0,275	0,270	0,316	0,125
FRANCE									
Low	Not isolated	0,633	0,769	0,782	0,656	0,686	0,637	0,574	0,627
	Isolated	0,367	0,231	0,218	0,344	0,314	0,363	0,426	0,373
Middle	Not isolated	0,763	0,738	0,763	0,822	0,794	0,764	0,735	0,667
	Isolated	0,237	0,262	0,237	0,178	0,206	0,236	0,265	0,333
High	Not isolated	0,748	0,752	0,872	0,727	0,808	0,726	0,773	0,875
	Isolated	0,252	0,248	0,128	0,273	0,192	0,274	0,227	0,125
HUNGARY									
Low	Not isolated	0,341	0,292	0,412	0,271	0,339	0,415	0,356	0,323
	Isolated	0,659	0,708	0,588	0,729	0,661	0,585	0,644	0,677
Middle	Not isolated	0,517	0,416	0,316	0,270	0,530	0,391	0,400	0,339
	Isolated	0,483	0,584	0,684	0,730	0,470	0,609	0,600	0,661
High	Not isolated	0,642	0,656	0,581	0,833	0,610	0,598	0,429	0,333
	Isolated	0,358	0,344	0,419	0,167	0,390	0,402	0,571	0,667
NETHERLANDS									
Low	Not isolated	0,535	0,588	0,606	0,557	0,610	0,661	0,684	0,626
	Isolated	0,465	0,412	0,394	0,443	0,390	0,339	0,316	0,374
Middle	Not isolated	0,595	0,617	0,603	0,696	0,728	0,706	0,686	0,563
	Isolated	0,405	0,383	0,397	0,304	0,272	0,294	0,314	0,438
High	Not isolated	0,647	0,728	0,791	0,500	0,779	0,738	0,725	0,632
	Isolated	0,353	0,272	0,209	0,500	0,221	0,262	0,275	0,368
NORWAY									
Low	Not isolated	0,635	0,652	0,672	0,535	0,625	0,755	0,734	0,623
	Isolated	0,365	0,348	0,328	0,441	0,375	0,245	0,266	0,377
Middle	Not isolated	0,729	0,756	0,713	0,797	0,721	0,799	0,704	0,273
	Isolated	0,271	0,244	0,287	0,203	0,279	0,201	0,296	0,727
High	Not isolated	0,767	0,809	0,790	0,588	0,831	0,807	0,800	0,947
	Isolated	0,233	0,191	0,210	0,412	0,169	0,193	0,200	0,053
POLAND									
Low	Not isolated	0,531	0,411	0,432	0,413	0,410	0,349	0,447	0,333
	Isolated	0,469	0,589	0,568	0,587	0,590	0,651	0,553	0,667
Middle	Not isolated	0,627	0,521	0,530	0,459	0,564	0,511	0,487	0,633

	Isolated	0,373	0,479	0,470	0,541	0,436	0,489	0,513	0,367
High	Not isolated	0,673	0,686	0,875	0,500	0,724	0,667	0,875	0,625
	Isolated	0,327	0,314	0,125	0,500	0,276	0,333	0,143	0,375
SWEDEN									
Low	Not isolated	0,451	0,576	0,580	0,491	0,650	0,664	0,578	0,597
	Isolated	0,549	0,424	0,420	0,509	0,350	0,336	0,422	0,403
Middle	Not isolated	0,712	0,741	0,742	0,655	0,724	0,654	0,689	0,778
	Isolated	0,288	0,259	0,258	0,345	0,276	0,346	0,311	0,222
High	Not isolated	0,796	0,750	0,686	0,765	0,844	0,772	0,831	0,833
	Isolated	0,204	0,250	0,314	0,235	0,156	0,228	0,169	0,167
SWITZERLAND									
Low	Not isolated	0,659	0,631	0,632	0,471	0,495	0,563	0,506	0,581
	Isolated	0,341	0,369	0,368	0,529	0,505	0,437	0,494	0,419
Middle	Not isolated	0,636	0,624	0,596	0,609	0,654	0,649	0,611	0,581
	Isolated	0,364	0,376	0,404	0,391	0,346	0,351	0,389	0,419
High	Not isolated	0,633	0,525	0,636	0,750	0,642	0,622	0,750	0,750
	Isolated	0,367	0,475	0,364	0,250	0,358	0,378	0,250	0,250
TURIN AND TUSCANY (ITALIAN DATA APPLIED)									
Low	Not isolated	0,451	0,459	0,596	0,453	0,512	0,458	0,362	0,432
	Isolated	0,549	0,541	0,404	0,547	0,488	0,542	0,638	0,568
Middle	Not isolated	0,593	0,573	0,563	0,474	0,404	0,470	0,500	0,643
	Isolated	0,407	0,427	0,438	0,526	0,596	0,530	0,500	0,357
High	Not isolated	0,510	0,523	0,476	0,500	0,500	0,613	0,455	0,200
	Isolated	0,490	0,477	0,524	0,500	0,500	0,387	0,545	0,800

Self-reported social isolation classified as ‘isolated’ (Much less than most, less than most) and ‘not isolated’ (About the same, more than most, much more than most).

Table AB 4: Prevalence of living alone

		Men				Women			
	age	30-44	45-59	60-69	70-79	30-44	45-59	60-69	70-79
Education	**Living alone**	**AUSTRIA**							
Low	Living alone	0,080	0,063	0,143	0,208	0,039	0,054	0,215	0,382
	Living together	0,920	0,937	0,857	0,792	0,961	0,946	0,785	0,618
Middle	Living alone	0,109	0,066	0,073	0,120	0,058	0,071	0,221	0,415
	Living together	0,891	0,934	0,927	0,880	0,942	0,929	0,779	0,585
High	Living alone	0,233	0,088	0,077	0,267	0,082	0,096	0,286	0,400
	Living together	0,767	0,912	0,923	0,733	0,918	0,904	0,714	0,600
		BASQUE COUNTRY. MADRID AND BARCELONA (SPANISH DATA APPLIED)							
Low	Living alone	0,088	0,062	0,064	0,092	0,030	0,033	0,090	0,219
	Living together	0,912	0,938	0,936	0,908	0,970	0,967	0,910	0,781
Middle	Living alone	0,075	0,053	0,083	0,167	0,046	0,113	0,091	0,556
	Living together	0,925	0,947	0,917	0,833	0,954	0,887	0,909	0,444
High	Living alone	0,060	0,127	0,048	0,125	0,090	0,064	0,200	0,500
	Living together	0,940	0,873	0,952	0,875	0,910	0,936	0,800	0,500
		BELGIUM							
Low	Living alone	0,139	0,119	0,078	0,230	0,011	0,167	0,231	0,383
	Living together	0,861	0,881	0,922	0,770	0,989	0,833	0,769	0,617
Middle	Living alone	0,143	0,090	0,171	0,229	0,043	0,090	0,180	0,500
	Living together	0,857	0,910	0,829	0,771	0,957	0,910	0,820	0,500
High	Living alone	0,080	0,140	0,082	0,103	0,077	0,102	0,238	0,214
	Living together	0,920	0,860	0,918	0,897	0,923	0,898	0,762	0,786
		CZECH REPUBLIC							
Low	Living alone	0,050	0,194	0,250	0,147	0,050	0,158	0,297	0,468
	Living together	0,950	0,806	0,750	0,853	0,950	0,842	0,703	0,532
Middle	Living alone	0,072	0,081	0,094	0,202	0,024	0,099	0,214	0,371
	Living together	0,928	0,919	0,906	0,798	0,976	0,901	0,786	0,621
High	Living alone	0,062	0,083	0,045	0,167	0,017	0,088	0,065	0,333
	Living together	0,938	0,917	0,955	0,833	0,983	0,912	0,935	0,667
		DENMARK							
Low	Living alone	0,208	0,246	0,196	0,200	0,000	0,118	0,329	0,397
	Living together	0,792	0,754	0,804	0,800	1,000	0,881	0,671	0,603
Middle	Living alone	0,203	0,150	0,107	0,131	0,068	0,168	0,256	0,509
	Living together	0,797	0,850	0,893	0,869	0,932	0,832	0,744	0,491
High	Living alone	0,134	0,068	0,157	0,263	0,081	0,156	0,241	0,545
	Living together	0,866	0,932	0,843	0,737	0,919	0,844	0,759	0,455
		ENGLAND AND WALES. SCOTLAND (UNITED KINGDOM DATA APPLIED)							
Low	Living alone	0,158	0,122	0,161	0,257	0,068	0,117	0,246	0,489
	Living together	0,842	0,878	0,839	0,743	0,932	0,883	0,754	0,511
Middle	Living alone	0,145	0,268	0,091	0,200	0,039	0,066	0,429	0,571
	Living together	0,855	0,732	0,909	0,800	0,961	0,934	0,571	0,429
High	Living alone	0,174	0,131	0,069	0,143	0,099	0,176	0,314	0,333
	Living together	0,826	0,869	0,931	0,857	0,901	0,824	0,686	0,667
		ESTONIA							

Low	Living alone	0,077	0,136	0,156	0,296	0,000	0,333	0,341	0,537
	Living together	0,923	0,864	0,844	0,704	1,000	0,667	0,659	0,463
Middle	Living alone	0,126	0,128	0,293	0,171	0,030	0,164	0,330	0,585
	Living together	0,874	0,872	0,707	0,829	0,970	0,836	0,670	0,415
High	Living alone	0,152	0,100	0,000	0,000	0,045	0,100	0,242	0,400
	Living together	0,848	0,900	1,000	1,000	0,955	0,900	0,758	0,600
FINLAND									
Low	Living alone	0,140	0,220	0,239	0,265	0,056	0,182	0,303	0,475
	Living together	0,860	0,780	0,761	0,735	0,944	0,818	0,697	0,525
Middle	Living alone	0,192	0,189	0,190	0,133	0,101	0,164	0,250	0,552
	Living together	0,808	0,811	0,810	0,867	0,899	0,836	0,750	0,448
High	Living alone	0,189	0,076	0,843	0,095	0,153	0,162	0,298	0,688
	Living together	0,811	0,924	0,157	0,905	0,847	0,838	0,702	0,313
FRANCE									
Low	Living alone	0,102	0,112	0,129	0,106	0,064	0,087	0,275	0,382
	Living together	0,898	0,888	0,871	0,894	0,936	0,913	0,725	0,618
Middle	Living alone	0,132	0,100	0,066	0,091	0,053	0,086	0,327	0,333
	Living together	0,868	0,900	0,934	0,909	0,947	0,914	0,673	0,667
High	Living alone	0,099	0,086	0,064	0,182	0,054	0,097	0,273	0,667
	Living together	0,901	0,914	0,936	0,818	0,946	0,903	0,727	0,333
HUNGARY									
Low	Living alone	0,091	0,109	0,208	0,216	0,016	0,072	0,245	0,382
	Living together	0,909	0,891	0,792	0,784	0,984	0,928	0,755	0,618
Middle	Living alone	0,074	0,067	0,071	0,068	0,028	0,115	0,214	0,400
	Living together	0,926	0,933	0,929	0,932	0,972	0,885	0,786	0,600
High	Living alone	0,113	0,044	0,097	0,042	0,030	0,239	0,355	0,889
	Living together	0,887	0,956	0,903	0,958	0,970	0,761	0,645	0,111
NETHERLANDS									
Low	Living alone	0,108	0,098	0,102	0,124	0,015	0,085	0,215	0,472
	Living together	0,892	0,902	0,898	0,876	0,985	0,915	0,785	0,528
Middle	Living alone	0,123	0,079	0,119	0,160	0,065	0,091	0,294	0,471
	Living together	0,877	0,921	0,881	0,840	0,935	0,909	0,706	0,529
High	Living alone	0,117	0,094	0,081	0,889	0,091	0,156	0,225	0,474
	Living together	0,883	0,906	0,919	0,111	0,909	0,844	0,775	0,526
NORWAY									
Low	Living alone	0,192	0,214	0,180	0,256	0,075	0,128	0,281	0,588
	Living together	0,808	0,787	0,820	0,744	0,925	0,872	0,719	0,412
Middle	Living alone	0,188	0,121	0,147	0,172	0,079	0,134	0,247	0,511
	Living together	0,812	0,879	0,853	0,828	0,921	0,866	0,753	0,489
High	Living alone	0,155	0,096	0,111	0,147	0,135	0,126	0,400	0,526
	Living together	0,845	0,904	0,889	0,853	0,865	0,874	0,600	0,474
POLAND									
Low	Living alone	0,058	0,138	0,139	0,186	0,024	0,080	0,127	0,273
	Living together	0,942	0,862	0,861	0,814	0,976	0,920	0,873	0,727
Middle	Living alone	0,030	0,057	0,120	0,184	0,006	0,062	0,238	0,375
	Living together	0,970	0,943	0,880	0,816	0,994	0,938	0,762	0,625

High	Living alone	0,086	0,020	0,059	0,182	0,065	0,083	0,429	0,333
	Living together	0,914	0,980	0,941	0,818	0,935	0,917	0,571	0,667
SWEDEN									
Low	Living alone	0,141	0,181	0,152	0,299	0,050	0,162	0,272	0,423
	Living together	0,859	0,819	0,848	0,701	0,950	0,838	0,728	0,577
Middle	Living alone	0,194	0,148	0,167	0,241	0,071	0,144	0,130	0,222
	Living together	0,806	0,852	0,833	0,759	0,929	0,856	0,870	0,778
High	Living alone	0,187	0,142	0,039	0,471	0,103	0,179	0,400	0,550
	Living together	0,813	0,858	0,961	0,529	0,897	0,821	0,600	0,450
SWITZERLAND									
Low	Living alone	0,209	0,118	0,125	0,139	0,060	0,119	0,267	0,456
	Living together	0,791	0,882	0,875	0,861	0,940	0,881	0,733	0,544
Middle	Living alone	0,125	0,124	0,121	0,167	0,103	0,137	0,287	0,442
	Living together	0,875	0,876	0,879	0,833	0,897	0,863	0,713	0,558
High	Living alone	0,217	0,131	0,212	0,167	0,171	0,150	0,375	0,500
	Living together	0,783	0,869	0,788	0,833	0,829	0,850	0,625	0,500
TURIN AND TUSCANY (ITALIAN DATA APPLIED)									
Low	Living alone	0,060	0,051	0,089	0,125	0,017	0,041	0,113	0,264
	Living together	0,940	0,949	0,911	0,875	0,983	0,959	0,887	0,736
Middle	Living alone	0,088	0,092	0,059	0,158	0,049	0,059	0,040	0,154
	Living together	0,912	0,908	0,941	0,842	0,951	0,941	0,960	0,846
High	Living alone	0,059	0,083	0,043	0,083	0,109	0,121	0,091	0,500
	Living together	0,941	0,917	0,957	0,917	0,891	0,879	0,909	0,500

Living alone measured with ‘number of people living as a regular member of household’ classified as ‘living alone’ and ‘living together’.

Table AB 5: Prevalence of social participation

		Men				Women			
	age	30-44	45-59	60-69	70-79	30-44	45-59	60-69	70-79
Education	**Social participation**	**AUSTRIA**							
Low	No participation	0.608	0.666	0.699	0.715	0.724	0.708	0.748	0.805
	Participation	0.392	0.334	0.301	0.286	0.277	0.292	0.252	0.195
Middle	No participation	0.566	0.513	0.526	0.572	0.560	0.614	0.641	0.649
	Participation	0.434	0.487	0.474	0.428	0.440	0.386	0.360	0.352
High	No participation	0.431	0.443	0.540	0.664	0.514	0.620	0.457	0.209
	Participation	0.570	0.557	0.460	0.337	0.486	0.380	0.543	0.791
		BARCELONA							
Low	No participation	0.758	0.778	0.789	0.794	0.865	0.799	0.782	0.801
	Participation	0.242	0.222	0.211	0.206	0.135	0.201	0.218	0.199
Middle	No participation	0.693	0.658	0.731	0.829	0.849	0.694	0.872	0.981
	Participation	0.307	0.343	0.269	0.171	0.151	0.306	0.128	0.019
High	No participation	0.624	0.523	0.495	0.513	0.621	0.535	0.673	0.850
	Participation	0.376	0.477	0.505	0.487	0.379	0.465	0.327	0.150
		BASQUE COUNTRY. MADRID AND BARCELONA (SPANISH DATA APPLIED)							
Low	No participation	0.758	0.778	0.789	0.794	0.865	0.799	0.782	0.801
	Participation	0.242	0.222	0.211	0.206	0.135	0.201	0.218	0.199
Middle	No participation	0.693	0.658	0.731	0.829	0.849	0.694	0.872	0.981
	Participation	0.307	0.343	0.269	0.171	0.151	0.306	0.128	0.019
High	No participation	0.624	0.523	0.495	0.513	0.621	0.535	0.673	0.850
	Participation	0.376	0.477	0.505	0.487	0.379	0.465	0.327	0.150
		BELGIUM							
Low	No participation	0.607	0.500	0.526	0.620	0.575	0.592	0.614	0.634
	Participation	0.393	0.500	0.474	0.380	0.425	0.408	0.386	0.366
Middle	No participation	0.435	0.397	0.413	0.457	0.493	0.558	0.534	0.464
	Participation	0.565	0.603	0.587	0.543	0.507	0.442	0.466	0.536
High	No participation	0.359	0.375	0.372	0.360	0.368	0.469	0.545	0.593
	Participation	0.641	0.625	0.628	0.640	0.633	0.531	0.455	0.407
		DENMARK							
Low	No participation	0.692	0.628	0.620	0.646	0.658	0.570	0.530	0.523
	Participation	0.308	0.373	0.380	0.354	0.342	0.430	0.470	0.477
Middle	No participation	0.448	0.480	0.516	0.548	0.475	0.407	0.422	0.483
	Participation	0.552	0.520	0.485	0.452	0.525	0.594	0.578	0.517
High	No participation	0.411	0.340	0.364	0.440	0.435	0.323	0.331	0.404
	Participation	0.589	0.661	0.636	0.560	0.565	0.677	0.669	0.596
		ENGLAND & WALES							
Low	No participation	0.515	0.512	0.563	0.633	0.738	0.578	0.534	0.570
	Participation	0.485	0.488	0.437	0.367	0.263	0.423	0.466	0.430
Middle	No participation	0.407	0.224	0.168	0.165	0.420	0.261	0.239	0.283
	Participation	0.593	0.776	0.832	0.835	0.580	0.739	0.761	0.717
High	No participation	0.354	0.376	0.378	0.367	0.342	0.290	0.327	0.414
	Participation	0.646	0.624	0.622	0.633	0.658	0.710	0.673	0.586
		FINLAND							
Low	No participation	0.724	0.638	0.611	0.626	0.825	0.649	0.583	0.612
	Participation	0.276	0.362	0.389	0.375	0.175	0.351	0.417	0.388
Middle	No participation	0.552	0.609	0.578	0.501	0.553	0.508	0.580	0.696
	Participation	0.448	0.391	0.422	0.499	0.447	0.492	0.420	0.305
High	No participation	0.493	0.498	0.684	0.865	0.437	0.380	0.414	0.497
	Participation	0.507	0.502	0.316	0.136	0.563	0.621	0.586	0.503
		FRANCE							
Low	No participation	0.771	0.592	0.577	0.663	0.744	0.683	0.677	0.704
	Participation	0.229	0.408	0.424	0.337	0.256	0.317	0.323	0.296
Middle	No participation	0.563	0.574	0.600	0.630	0.584	0.528	0.508	0.512
	Participation	0.437	0.426	0.400	0.370	0.416	0.472	0.492	0.488
High	No participation	0.409	0.349	0.376	0.450	0.366	0.257	0.323	0.498
	Participation	0.591	0.651	0.624	0.551	0.635	0.743	0.677	0.502

HUNGARY									
Low	No participation	0.847	0.864	0.889	0.912	0.881	0.833	0.839	0.872
	Participation	0.153	0.136	0.111	0.088	0.119	0.167	0.161	0.128
Middle	No participation	0.786	0.737	0.722	0.731	0.691	0.779	0.888	0.950
	Participation	0.214	0.263	0.278	0.269	0.309	0.221	0.113	0.050
High	No participation	0.454	0.637	0.652	0.577	0.599	0.629	0.744	0.851
	Participation	0.546	0.363	0.348	0.423	0.401	0.371	0.256	0.149
NETHERLANDS									
Low	No participation	0.608	0.511	0.517	0.578	0.557	0.535	0.573	0.636
	Participation	0.392	0.489	0.484	0.423	0.443	0.465	0.427	0.364
Middle	No participation	0.568	0.533	0.512	0.501	0.520	0.413	0.428	0.510
	Participation	0.433	0.467	0.488	0.499	0.480	0.587	0.572	0.491
High	No participation	0.450	0.336	0.385	0.524	0.416	0.374	0.408	0.481
	Participation	0.550	0.664	0.615	0.476	0.585	0.626	0.592	0.519
NORWAY									
Low	No participation	0.595	0.613	0.641	0.669	0.539	0.564	0.611	0.661
	Participation	0.406	0.387	0.359	0.332	0.461	0.436	0.389	0.339
Middle	No participation	0.470	0.444	0.518	0.634	0.443	0.471	0.505	0.539
	Participation	0.530	0.557	0.482	0.366	0.557	0.529	0.495	0.461
High	No participation	0.398	0.377	0.458	0.585	0.344	0.419	0.399	0.332
	Participation	0.602	0.623	0.542	0.415	0.656	0.581	0.601	0.668
POLAND									
Low	No participation	0.928	0.932	0.969	0.990	0.996	0.973	0.931	0.907
	Participation	0.072	0.068	0.031	0.010	0.004	0.027	0.069	0.093
Middle	No participation	0.883	0.897	0.878	0.837	0.945	0.912	0.876	0.846
	Participation	0.118	0.104	0.122	0.163	0.055	0.088	0.124	0.154
High	No participation	0.669	0.664	0.672	0.686	0.666	0.738	0.836	0.906
	Participation	0.331	0.336	0.328	0.314	0.334	0.262	0.164	0.094
SWEDEN									
Low	No participation	0.425	0.500	0.550	0.579	0.633	0.581	0.580	0.608
	Participation	0.575	0.501	0.450	0.421	0.368	0.419	0.420	0.393
Middle	No participation	0.372	0.377	0.420	0.477	0.574	0.505	0.543	0.632
	Participation	0.629	0.623	0.580	0.523	0.426	0.495	0.457	0.368
High	No participation	0.331	0.295	0.399	0.582	0.364	0.408	0.394	0.351
	Participation	0.669	0.705	0.601	0.418	0.636	0.592	0.606	0.649
TURIN AND TUSCANY (ITALIAN DATA APPLIED)									
Low	No participation	0.777	0.756	0.755	0.766	0.805	0.868	0.885	0.881
	Participation	0.223	0.244	0.245	0.234	0.195	0.132	0.115	0.119
Middle	No participation	0.705	0.583	0.676	0.831	0.775	0.712	0.692	0.702
	Participation	0.295	0.417	0.324	0.169	0.225	0.289	0.308	0.298
High	No participation	0.706	0.502	0.520	0.660	0.623	0.648	0.836	0.952
	Participation	0.294	0.498	0.480	0.340	0.377	0.352	0.164	0.048

Self-reported social participation classified as ‘no participation’ (membership of null clubs, associations, etc.) and ‘participation’ (membership of at least one club, association, etc.).

Appendix ABC Saved deaths according to elimination of educational inequalities in social risk factors in the age groups 30-45, 46-59, 60-69, 70-79 and all ages.

Table ABC 1. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between low and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 30-45.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	0,40	0,86	2,89	1,56	2,68	2,25	0	0	3,23	2,26
Sweden	0,52	0,25	0,94	0,51	0,47	0,82	0	0	2,50	0,96
Norway	0,03	0,1	0,52	0,41	0,88	0,61	0,14	0	0,95	1,01
Denmark	0,30	0,21	1,64	0,69	2,43	1,39	0,56	0	0,76	3,05
England &W	0,21	0,37	0,59	0,34	1,07	2,13	0	0	0,56	0,53
Scotland	0,25	0,37	0,68	0,34	NA	NA	0	0	0,66	0,54
Netherlands	0,40	0,24	0	0	0,54	0,57	0	0	0,60	1,07
Belgium	1,96	0,36	0,59	0,63	1,86	1,19	0,38	0	2,67	1,53
France	1,71	0,12	0	0	3,11	2,07	0,02	0,05	1,65	1,12
Switzerland	0,06	0,38	0,40	0	NA	NA	0	0	0	0,67
Austria	0	0,30	0	0	0,81	0,81	0	0	0	0,89
Barcelona	1,53	0	1,69	0	1,32	1,35	0,25	0	1,49	0,79
Basque C	1,61	0	1,75	0	1,40	1,29	0,26	0	1,57	0,75
Madrid	1,77	0	1,96	0	1,53	1,21	0,28	0	1,73	0,70
Turin	2,13	0,59	0	0	0,51	0,75	0	0	0,68	0
Tuscany	2,02	0,89	0	0	0,49	1,12	0	0	0,64	0
Hungary	1,24	1,55	9,13	1,10	9,79	3,32	0	0	11,50	4,92
Czech R	0,71	0,56	1,52	0,59	NA	NA	0	0,09	0	1,17
Poland	2,90	1,20	2,97	0,30	3,66	1,98	0	0	3,33	3,05
Estonia	2,84	4,85	14,92	2,65	NA	NA	0	0	10,60	8,39

Table ABC 2. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between mid and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 30-45.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	0	0	1,37	0,22	0,36	0,279	0,02	0	0,31	0,45
Sweden	0,18	0,10	0,42	0,04	0,20	0,55	0,03	0	0,64	0,52
Norway	0	0,06	0,47	0,22	0,48	0,38	0,18	0	041	0,65
Denmark	0,10	0,11	0,71	0,22	0,19	0,09	0,29	0	0,03	0,58
England &W	0	0	0,01	0	0,17	0,11	0	0	0,06	0
Scotland	0	0	0,01	0	NA	NA	0	0	0,08	0
Netherlands	0,04	0,02	0	0	0,33	0,19	0,01	0	0,23	0,15
Belgium	0,38	0,05	0,31	0,20	0,20	0,19	0,13	0	0,38	0,29
France	0,62	0	0,39	0	0,98	0,48	0,18	0	0	0,05
Switzerland	0,04	0,07	0	0	NA	NA	0	0	0	0,27
Austria	0	0,16	0	0	1,11	0,13	0	0	0	0,08
Barcelona	0,02	0	0,19	0	0,14	0,18	0,03	0	0,15	0,02
Basque C	0,02	0	0,20	0	0,16	0,20	0,03	0	0,17	0,02
Madrid	0,02	0	0,22	0	0,18	0,28	0,03	0	0,20	0,02
Turin	0,05	0,08	0	0	0	0,15	0,04	0	0	0,14
Tuscany	0,04	0,04	0	0	0	0,08	0,04	0	0	0,07
Hungary	1,11	0,06	1,49	0,32	4,27	0,34	0	0	2,58	0,47
Czech R	1,31	0,25	0,43	0	NA	NA	0,65	0,02	0,79	0,48
Poland	0,77	0,42	0	0	2,87	1,06	0	0	1,05	1,03
Estonia	2,50	0,36	6,93	0,38	NA	NA	0	0	9,96	2,68

Table ABC 3. Saved deaths per 100,000 person years in all-cause mortality by eliminating social risk factors between the low and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 45-59.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	3,28	1,79	7,77	0,08	3,88	3,66	3,38	0,23	7,88	5,01
Sweden	0,57	0,95	1,55	0	2,85	1,71	0,45	0	3,74	1,72
Norway	0,90	0,44	2,75	0,03	2,60	1,36	1,14	0,02	2,80	0,81
Denmark	0	2,07	8,76	0,92	7,37	4,80	3,83	0	5,07	5,72
England &W	2,39	1,22	0,89	0,55	3,38	4,61	0	0	0	3,09
Scotland	2,05	1,19	0,77	0,54	NA	NA	0	0	0	3,02
Netherlands	1,48	0,66	0	0	2,66	1,98	0,05	0	3,30	1,50
Belgium	5,35	2,49	2,87	0,97	4,00	2,20	0	0,98	10,56	6,85
France	3,36	0	0,89	0	6,39	5,36	0,58	0	0	1,83
Switzerland	0,87	0,40	0	0	NA	NA	0	0	0	0,65
Austria	2,45	2,13	0,24	0	3,05	1,09	0	0	4,53	2,42
Barcelona	0	0,69	0,66	0	6,65	2,93	0	0	9,73	4,56
Basque C	0	0,73	0,68	0	6,89	3,11	0	0	10,09	4,83
Madrid	0	0,72	0,69	0	6,96	3,07	0	0	10,22	4,77
Turin	5,46	2,27	0,79	0	5,64	2,73	0	0	2,22	3,08
Tuscany	5,05	3,00	0,73	0	5,22	3,60	0	0	2,06	4,06
Hungary	5,88	0,68	23,70	0	18,27	6,53	4,74	0	44,40	9,18
Czech R	2,42	3,06	2,69	0,34	NA	NA	1,02	0,67	0	5,21
Poland	0	2,72	10,18	1,05	8,39	3,19	3,38	0	13,78	6,83
Estonia	0,27	2,31	21,74	4,35	NA	NA	1,80	4,37	30,32	13,22

Table ABC 4. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between mid and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 45-59.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	1,11	0,66	4,16	0,49	2,21	0,93	1,91	0,01	3,71	1,60
Sweden	0	0,28	0,07	0	1,49	1,03	0,09	0	0,26	1,98
Norway	0,41	0	2,55	0	1,36	0,59	0,42	0,08	1,75	0,15
Denmark	2,00	0,69	3,35	0	2,81	0,77	1,36	0,09	1,70	0,41
England &W	1,25	0,19	2,11	0	0	0	1,18	0	0,07	0,59
Scotland	1,41	0,32	2,38	0	NA	NA	1,33	0	0,07	1,03
Netherlands	0	0	0	0	2,36	0,30	0	0	2,09	0,39
Belgium	0,73	0,22	0,22	0	0,22	0,45	0	0	1,33	1,41
France	0,81	0	0,31	0	4,92	1,74	0,26	0	0,51	0
Switzerland	056	0,64	0,34	0	NA	NA	0	0	0	0
Austria	0,80	0,07	0	0	2,26	0	0	0	1,19	0,44
Barcelona	0	0,10	0	0,23	1,51	0,43	0	0,12	2,92	0,80
Basque C	0	0,09	0	0,23	1,14	0,42	0	0,11	2,88	0,79
Madrid	0	0,12	0	0,29	1,24	0,54	0	0,15	3,16	1,00
Turin	1	0,97	0,07	0	0,66	0,27	0,06	0	0	0,95
Tuscany	0,82	0,35	0,06	0	0,54	0,10	0,05	0	0	0,35
Hungary	2,20	0,63	4,95	0	3,57	1,84	0,73	0	13,15	3,91
Czech R	2,42	2,61	0	0	NA	NA	0	0,14	0	5,67
Poland	0	0,57	3,38	1,14	11,90	3,08	1,75	0	13,90	4,54
Estonia	0	1,60	17,51	0,23	NA	NA	1,75	1,35	4,17	8,64

Table ABC 5. Saved deaths per 100,000 person years in all-cause mortality by eliminating social risk factors between the low and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 60-69.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	1,65	0,62	6,69	1,31	0	2,11	0	0,05	7,24	4,52
Sweden	1,91	1,21	1,84	0	2,74	1,21	1,73	0	3,00	4,39
Norway	2,05	0	2,23	0	2,44	1,96	0,79	0	2,58	1,01
Denmark	5,89	5,06	3,39	4,92	7,27	4,65	0,94	1,67	1,89	10,91
England &W	0	1,17	2,45	2,16	6,00	5,07	2,51	0	8,30	8,50
Scotland	0	0,88	2,04	1,62	NA	NA	2,08	0	6,89	6,40
Netherlands	1,07	2,69	0,52	0,53	2,67	2,46	0,36	0	5,88	0,99
Belgium	8,14	0,25	0	0,70	5,41	1,29	0	0	6,06	5,86
France	3,68	1,90	1,85	1,00	5,33	4,44	1,47	0,02	4,03	3,99
Switzerland	1,23	1,86	0	0	NA	NA	0	0	0,06	2,83
Austria	4,24	1,85	1,37	2,14	2,45	3,81	0,88	0,76	4,08	2,35
Barcelona	8,47	3,24	0	0	8,42	1,32	0,41	0	5,12	0
Basque C	8,62	3,13	0	0	8,57	1,28	0,42	0	5,21	0
Madrid	9,68	3,79	0	0	9,63	1,54	0,47	0	5,85	0
Turin	0	4,51	0,60	0	6,72	0,71	1,17	0,29	0	2,09
Tuscany	0	6,16	0,58	0	6,47	0,97	1,13	0,39	0	2,85
Hungary	1,95	1,53	8,72	0,29	13,11	2,90	5,48	0	14,78	3,43
Czech R	5,32	3,74	6,12	2,91	NA	NA	2,42	2,86	8,77	2,30
Poland	4,98	3,98	5,43	0	8,41	1,42	2,09	0	20,36	8,81
Estonia	7,47	2,02	15,47	1,26	NA	NA	6,55	1,47	20,49	6,95

Table ABC 6. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between mid and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 60-69.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	3,44	0,17	4,20	0	0	1,31	0	0	0	0
Sweden	1,98	0,10	2,39	0	0,51	0,10	2,59	0	0	2,96
Norway	4,07	0	1,89	0	1,64	1,40	0,82	0	3,39	2,04
Denmark	2,68	1,78	0	1,03	4,06	1,10	0	0,15	1,17	1,93
England &W	0,81	1,57	0	1,23	0	0	0,26	0,68	0	1,47
Scotland	1,14	2,03	0	1,60	NA	NA	0,37	0,91	0	1,92
Netherlands	1,73	1,02	2,58	0,41	2,57	0,19	0,64	0,51	5,92	0,57
Belgium	2,73	0	0,79	0	0,46	0	0,82	0	0,17	0
France	2,93	0,48	1,47	0,82	4,82	1,22	0,04	0,29	3,95	0,41
Switzerland	0,30	0,78	0	0	NA	NA	0	0	1,49	2,59
Austria	0,53	0	0	1,51	0	2,27	0	0	0	0,33
Barcelona	0	0,46	0	0	2,39	0,61	0,31	0	0,79	0
Basque C	0	0,40	0	0	2,68	0,53	0,35	0	0,89	0
Madrid	0	0,63	0	0	3,10	0,83	0,42	0	1,03	0
Turin	0	1,25	0,63	0,50	1,54	0	0,14	0	0	0
Tuscany	0	0,45	0,67	0,02	1,63	0	0,15	0	0	0
Hungary	0	0	0	0	2,60	1,76	0	0	14,55	0,56
Czech R	10,23	4,35	6,33	2,54	NA	NA	2,01	2,72	5,71	1,61
Poland	6,51	4,42	5,79	0	12,84	0,82	3,45	0	35,37	10,64
Estonia	16,77	3,47	26,93	4,52	NA	NA	17,54	1,88	28,98	4,92

Table ABC 7. Saved deaths per 100,000 years in all-cause mortality by eliminating social risk factors between the low and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 70-79.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	3,87	0	6,83	0	0	2,26	5,15	0	7,95	12,31
Sweden	4,63	0	0	0	0	0	0	0	11,33	6,11
Norway	0	1,68	2,74	1,38	1,58	4,61	1,74	0,69	0	7,36
Denmark	8,70	3,16	0	0	8,09	3,80	0	0	11,97	0
England &W	6,43	0	9,94	8,99	12,73	5,36	4,58	4,25	15,52	7,21
Scotland	4,72	0	7,29	6,73	NA	NA	3,36	3,18	11,39	5,39
Netherlands	2,23	0	1,75	1,82	1,74	3,28	0	0	0	0,21
Belgium	0	0	14,14	6,00	12,08	1,07	4,96	3,64	12,65	9,67
France	0	3,33	0	0	6,71	3,64	0	0	3,66	7,17
Switzerland	1,04	1,90	2,39	0	NA	NA	0	0	5,12	3,25
Austria	4,89	8,37	0	0	1,09	13,42	0	0	6,58	12,68
Barcelona	6,86	7,09	0	0	10,71	0	0	0	0	4,84
Basque C	7,59	7,19	0	0	11,86	0	0	0	0	4,91
Madrid	8,85	8,79	0	0	13,82	0	0	0	0	6,00
Turin	0,82	6,94	0	0	4,63	0	1,62	0	3,21	0
Tuscany	0,81	9,02	0	0	4,58	0	1,61	0	3,18	0
Hungary	9,14	0	17,02	0	19,62	0,90	9,15	0	50,12	0,66
Czech R	8,42	13,80	1,75	11,77	NA	NA	0	2,60	4,08	13,56
Poland	0	9,26	2,40	1,57	9,61	0,01	0,12	0	4,45	10,46
Estonia	5,83	1,63	21,99	0	NA	NA	11,83	2,71	8,95	11,35

Table ABC 8. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between mid and high educational groups, upward levelling scenario, by risk factor, country and gender. Age 70-79.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	1,03	0	0	0	0	2,50	0,91	0	0	3,88
Sweden	0	0	0	0	0	0	0	0	6,62	1,87
Norway	0	1,23	4,25	0,19	2,01	4,36	0,87	0	0	19,97
Denmark	9,02	1,69	0	0	4,29	1,42	0	0	11,46	0
England &W	1,31	0	0,85	2,69	0	0	0,98	2,02	4,81	0
Scotland	1,57	0	1,02	3,78	NA	NA	1,18	2,84	5,77	0
Netherlands	0	0	2,22	0,43	0	0,36	0	0	0	1,43
Belgium	0,19	0	3,77	1,50	1,30	0	1,37	1,54	4,57	2,59
France	2,73	1,91	0	0	4,85	0,14	0	0	0	3,31
Switzerland	0	1,22	4,70	0	NA	NA	0	0	7,83	5,10
Austria	6,10	4,79	0	0	0	9,08	0	0	16,77	1,75
Barcelona	0,40	0	0	0,21	4,47	0,59	0,53	0,22	2,48	0
Basque C	0,43	0	0	0,20	4,84	0,55	0,57	0,20	2,68	0
Madrid	0,52	0	0	0,31	5,86	0,85	0,69	0,31	3,25	0
Turin	0	1,98	0	0	3,03	0	1,18	0	0,73	0
Tuscany	0	0,69	0	0	2,81	0	1,09	0	0,68	0
Hungary	2,65	0	5,60	0	6,32	1,72	0,95	0	33,90	0
Czech R	21,16	16,26	4,36	13,31	NA	NA	1,88	0	4,59	13,97
Poland	0	11,87	0,94	0	10,86	0	0,13	1,10	4,68	0
Estonia	22,69	0	29,91	1,99	NA	NA	10,91	5,83	10,41	18,87

Table ABC 9. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between low and high educational groups, upward levelling scenario, by risk factor, country and gender. All ages.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	9,20	3,27	24,18	2,94	6,56	10,27	8,53	0,28	26,29	24,10
Sweden	7,64	2,41	4,33	0,51	6,06	8,75	2,18	0	20,57	13,13
Norway	2,98	2,22	8,24	1,82	7,50	6,72	3,81	0,71	6,34	10,19
Denmark	14,89	10,50	13,79	6,53	25,22	14,60	5,33	1,67	19,68	19,68
England &W	9,03	2,76	13,89	12,04	23,18	17,17	7,09	4,25	24,38	19,33
Scotland	7,02	2,44	10,77	9,23	NA	NA	5,92	3,18	18,93	15,34
Netherlands	5,16	3,60	2,27	2,34	7,62	8,28	0,41	0	9,77	3,76
Belgium	15,45	3,11	17,60	8,30	23,35	5,73	5,34	4,62	31,94	23,90
France	7,74	5,36	2,74	1,00	21,53	15,52	2,08	0,07	9,34	14,12
Switzerland	3,20	4,55	2,77	0	NA	NA	0	0	5,18	7,40
Austria	11,57	12,65	1,61	2,14	7,40	19,12	0,89	0,76	15,19	18,35
Barcelona	16,86	11,02	2,35	0	27,10	5,60	0,66	0	16,34	10,18
Basque C	17,82	11,06	2,47	0	28,70	5,67	0,68	0	16,87	10,49
Madrid	20,30	13,28	2,65	0	31,95	5,18	0,76	0	17,80	11,48
Turin	8,41	14,31	1,39	0	17,50	4,18	2,80	0,29	6,11	5,16
Tuscany	7,88	19,06	1,31	0	16,76	5,69	2,74	0,39	5,87	6,91
Hungary	18,20	3,76	58,57	1,39	60,80	13,64	19,36	0	120,81	18,19
Czech R	16,86	21,16	12,08	15,60	NA	NA	3,44	6,22	12,85	22,24
Poland	7,88	17,15	20,98	2,92	30,08	6,60	5,58	0	41,90	29,14
Estonia	16,41	10,81	74,11	8,25	NA	NA	20,18	8,55	70,36	39,91

Table ABC 10. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality between mid and high educational groups, upward levelling scenario, by risk factor, country and gender. All ages.

	Functional social factors				Structural social factors					
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	5,58	0,84	9,73	0,71	2,57	5,02	2,83	0,01	4,02	5,93
Sweden	11,51	0,49	2,88	0,04	2,19	9,11	2,71	0	7,52	7,33
Norway	4,48	1,30	9,16	0,41	5,50	6,72	2,29	0,08	5,55	22,81
Denmark	13,79	4,26	4,05	1,25	11,34	3,38	1,65	0,24	14,35	2,92
England &W	3,37	1,75	2,96	3,92	0,17	0,11	2,43	2,72	4,93	2,07
Scotland	4,12	2,36	3,41	5,38	NA	NA	2,88	3,74	5,92	2,94
Netherlands	1,77	1,04	4,81	0,83	5,25	1,05	0,66	0,51	8,24	2,54
Belgium	4,03	0,27	5,09	1,70	2,19	0,64	2,33	1,54	6,45	4,29
France	7,08	2,38	2,18	0,82	15,57	3,57	0,48	0,29	4,46	3,77
Switzerland	0,90	2,72	5,04	0	NA	NA	0	0	9,32	7,70
Austria	19,16	5,02	0	1,51	3,40	11,49	0	0	17,96	2,60
Barcelona	0,41	0,56	0,17	0,45	8,14	1,81	0,87	0,33	6,34	0,81
Basque C	0,45	0,50	0,20	0,43	8,81	1,71	0,95	0,32	6,62	0,80
Madrid	0,54	0,75	0,22	0,60	10,38	2,49	1,13	0,46	7,63	1,03
Turin	1,05	4,28	0,70	0,05	5,23	0,42	1,43	0	0,73	1,10
Tuscany	0,86	1,52	0,73	0,02	4,99	0,17	1,33	0	0,68	0,42
Hungary	5,95	0,69	12,04	0,32	16,77	5,65	1,68	0	64,18	4,94
Czech R	35,12	23,46	11,12	15,85	NA	NA	3,95	2,88	11,09	21,72
Poland	7,28	17,28	10,11	1,14	38,48	4,97	5,32	1,10	55,00	16,21
Estonia	41,95	5,42	81,27	7,12	NA	NA	30,20	9,06	53,52	35,11

Table ABC 11. Saved deaths per 100,000 person years in educational inequalities in all-cause mortality, all educational groups, upward levelling scenario, by risk factor, country and gender. All ages.

	Functional social factors		Structural social factors							
	Perception of social support		Marital status		Lack of social participation		Living alone		Social isolation	
Population	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
Finland	14,78	4,10	33,91	3,66	9,13	15,29	11,36	0,30	30,31	30,03
Sweden	19,14	2,90	7,21	0,55	8,25	17,86	4,89	0	28,1	20,46
Norway	7,46	3,52	17,40	2,23	13,00	15,25	6,09	0,78	11,89	32,99
Denmark	28,68	14,76	17,84	7,78	36,57	17,99	6,976	1,91	34,03	22,60
England &W	12,39	4,51	16,82	15,95	23,35	17,27	9,52	6,97	29,31	21,39
Scotland	11,14	4,80	14,18	14,61	NA	NA	8,33	6,92	28,85	15,29
Netherlands	6,92	4,64	7,08	3,17	12,87	9,33	1,07	0,51	18,01	6,31
Belgium	19,48	3,38	22,69	10,00	25,54	6,37	7,66	6,16	38,39	28,19
France	14,83	7,74	4,92	1,82	37,10	19,08	2,55	0,36	13,79	17,89
Switzerland	4,10	7,27	7,82	0	NA	NA	0	0	14,50	15,10
Austria	30,73	17,67	1,61	3,64	10,77	30,61	0,89	0,76	33,15	20,95
Barcelona	17,27	11,58	2,52	0,45	35,25	7,41	1,52	0,33	22,68	10,99
Basque C	18,27	11,55	2,66	0,43	37,51	7,37	1,63	0,32	23,49	11,29
Madrid	20,84	14,02	2,87	0,60	42,33	8,30	1,89	0,46	25,42	12,50
Turin	9,46	18,59	2,09	0,05	22,73	4,60	4,22	0,29	6,84	6,26
Tuscany	8,75	20,58	2,03	0,02	21,74	5,86	4,07	0,39	6,55	7,33
Hungary	24,15	4,45	70,61	1,71	77,56	19,29	21,04	0	184,98	23,12
Czech R	51,98	44,62	23,20	31,45	NA	NA	7,40	9,10	23,94	43,96
Poland	15,16	34,44	31,09	4,06	68,55	11,56	10,90	1,10	96,89	45,35
Estonia	58,37	16,23	155,39	15,37	NA	NA	50,38	17,61	123,88	75,01