The Great Recession and unemployment in Europe: The impact on health and health inequalities
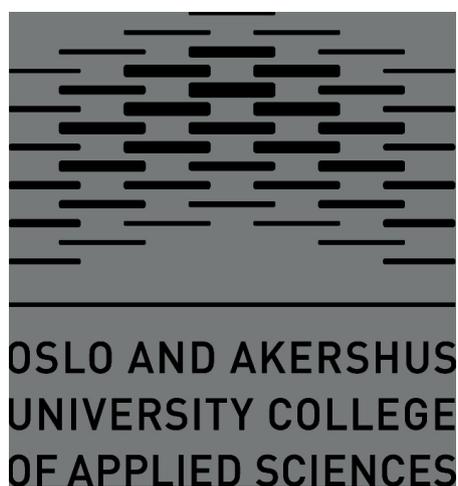
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Acknowledgements

Abstract

Economic declines, sovereign debt crises, and recessions are often assumed to generate social consequences in terms of unemployment, financial insecurity, and poverty. Do they also affect health and health inequalities? This thesis analyses the effects of the Great Recession and of the generosity of welfare policies on population health and health inequalities in Europe by addressing the following research questions:

1. What effects has the Great Recession had on health and health inequalities?
2. Have generous social policies mitigated any possible negative effects?
3. Whether and to what extent are individual unemployment transitions associated with deteriorating health? This question is further explored by investigating whether welfare policy generosity, income, and perceived economic strain are contributing mechanisms.

These three questions are investigated in five published studies. The first is a literature review of 46 studies investigating the possible effects of the Great Recession on public health and health inequalities. The other four studies use the longitudinal panel of the EU Statistics on Income and Living Conditions, combined with longitudinal models, to enable empirical investigations of individual changes in self-rated health. Longitudinal investigations are particularly advantageous in comparative research, as the resulting estimates can be controlled for all time-invariant factors, for example, stable variations in how various national cultures rate health.

The literature review (Study I) indicates that the Great Recession has led to deteriorating public health and increasing health inequalities. However, research designs, statistical methods, and health outcomes vary between the reviewed studies, making it difficult to compare their results. Furthermore, only a minority of the studies addressing the health effects of the Great Recession investigate whether it has led to increasing health inequalities, providing limited evidence for firm conclusions on that question.

The results of the empirical studies indicate that generous welfare policies are associated with more favourable health trends (Study II). However, this trend seems to be independent of how hard the countries were hit by the Great Recession, suggesting that generous welfare policies are not necessarily more important during unfavourable economic conditions.

Investigations of the individual health effects of unemployment transition suggest that unemployment has negative effects on health (studies III–V). These effects are less detrimental in countries providing generous unemployment benefits and services (Study IV), suggesting that generous welfare policies are important for the health of those directly exposed to unemployment. Although the thesis provides some evidence for a mediating effect of financial strain, the results do not indicate that declining income contributes to the health effects of individual unemployment (Study V). As such, the thesis provides no evidence that declining income *per se* is a mechanism explaining the health effects of unemployment. The contrasting findings, i.e., generous unemployment benefits and services mitigate, but income reductions do not mediate, the health effects of individual unemployment, illustrate the need for more thorough investigations of the mechanisms linking social policies, income, and health.

Sammendrag

Økonomiske nedgangstider, statsgjeldskriser og resesjoner er ofte antatt å gi konsekvenser i form av økt arbeidsledighet, økonomisk usikkerhet og fattigdom. Men påvirker de også helse og helseulikhet? Denne avhandlingen analyserer helseeffekten av krisen som rammet Europa i 2008, samt betydningen av generøse velferdsytelser på helse og helseulikheter i Europa. Avhandlingen undersøker følgende problemstillinger:

1. Hva er effekten av krisen på helse og helseforskjeller?

2. Har generøse velferdsytelser dempet eventuelle negative effekter av krisen på helse og helseforskjeller?

3. Om, og i hvilken grad fører arbeidsledighet til sviktende helse? Dette spørsmålet blir ytterligere utforsket ved å undersøke om generøse velferdsytelser, inntektsendringer og selvopplevde økonomiske vanskeligheter bidrar til å forklare helseeffekter av arbeidsledighet.

Disse tre spørsmålene er undersøkt gjennom fem publiserte studier. Den første studien er en litteraturgjennomgang av 46 studier som undersøker mulige effekter av krisen på helse og helseulikheter. De fire følgende studiene benytter den longitudinelle delen av EU Statistics on Income and Living Conditions (Levekårsundersøkelen), kombinert med longitudinelle statistiske modeller, noe som muliggjør empiriske undersøkelser av individuell endring i selvrapportert helse. Longitudinelle undersøkelser er spesielt fordelaktige i komparative analyser, fordi estimatene er kontrollert for alle faktorer som er stabile over tid, for eksempel kulturelle variasjoner i hvordan folk vurderer egen helse.

Litteraturgjennomgangen (studie I) indikerer at krisen både har ført til dårligere folkehelse og økende helseulikheter. Samtidig er det viktig å påpeke at forskningsdesign, statistiske metoder og helseutfall varierer, noe som gjør det vanskelig å sammenligne resultater på tvers av studier. Videre, er det bare et mindretall av studiene som undersøker krisens effekter på helseulikheter. Det er derfor begrenset grunnlag for å trekke bastante konklusjoner.

Resultatene fra de empiriske studiene i avhandlingen viser at generøse velferdsytelser korrelerer med mer gunstige helsetrender (studie II). Disse trendene er likevel uavhengig av hvor hardt landene ble rammet av krisen, noe som tyder på at generøse velferdsytelser ikke nødvendigvis er viktigere i nedgangstider enn i oppgangstider.

Undersøkelser av individuelle helseeffekter av arbeidsledighet tyder på negative helseeffekter (studie III, IV og V). Effektene er imidlertid mindre i land som har mer generøse

velferdsytelser (studie IV), noe som tyder på at en generøs velferdspolitikk påvirker helsen blant dem som er direkte eksponert for krisens sosiale konsekvenser. Selv om avhandlingen indikerer at selvopplevde økonomiske vanskeligheter bidrar til å forklare helseeffektene av arbeidsledighet, tyder ikke resultatene på at denne medierende effekten er drevet av faktisk inntektsreduksjon (studie V). Avhandlingen gir dermed ingen støtte til hypotesen om at inntektsreduksjon *per se* er mekanismen bak helseeffekten av arbeidsledighet. Kontrasterende funn i studiene IV og V, dvs. generøse velferdsytelser motvirker, mens inntektsreduksjon ikke medvirker, tydeliggjør behovet for nærmere undersøkelser av de mekanismene som bidrar til sammenheng mellom sosial politikk, inntekt og helse.

Contents

List of studies

Study I

Dahl, E., Tøge, A. G., Heggebø, K., Elstad, J. I., Berg, J. E., & Halvorsen, K. (2015). Er økonomisk krise ensbetydende med helsekrise – hva forteller forskningen? [Is economic crisis equivalent to health crisis – what does the research say?] *Tidsskrift for velferdsforskning*, 18(2), 62–73.[1]

Study II

Abebe, D. S., Tøge, A. G., & Dahl, E. (2016). Individual-level changes in self-rated health before and during the economic crisis in Europe. *International Journal for Equity in Health*, 15(1), 1–8. doi: 10.1186/s12939-015-0290-8

Study III

Tøge, A. G., & Blekesaune, M. (2015). Unemployment transitions and self-rated health in Europe: A longitudinal analysis of EU-SILC from 2008 to 2011. *Social Science & Medicine*, 143, 171–178. doi: 10.1016/j.socscimed.2015.08.040

Study IV

Tøge, A. G. (2016b). Health effects of unemployment in Europe during the Great Recession: The impact of unemployment generosity. *International Journal of Health Services*, 46(4), 614–641. doi: 10.1177/0020731416664688

Study V

Tøge, A. G. (2016a). Health effects of unemployment in Europe (2008–2011): A longitudinal analysis of income and financial strain as mediating factors. *International Journal for Equity in Health*, 15(1), 1–12. doi: 10.1186/s12939-016-0360-6

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[1] Links to supplementary material for Study I, including the reference list and table of the reviewed studies, are provided in Appendix 1.

List of appendices

1 Introduction

The 2008 economic crisis "quickly translated into hardships for households, who suffered unprecedented losses of jobs, earnings, and wealth" (OECD, 2014, p. 16). However, did it also affect health and health inequalities? Intuitively, most of us would say "yes", particularly regarding mental health. The overall assumption is that job loss, decreasing income, and budget cuts harm health, particularly in vulnerable populations (Marmot, Bloomer, & Goldblatt, 2013; Marmot, Friel, Bell, Houweling, & Taylor, 2008), and consequently cause increasing health inequalities (Frasquilho et al., 2016).

Several studies have investigated the health effects of the Great Recession (e.g. Ásgeirsdóttir, Corman, Noonan, Ólafsdóttir, & Reichman, 2014a; Baumbach & Gulis, 2014; Benmarhnia, Zunzunegui, Llácer, & Béland, 2014; Copeland et al., 2015; Karanikolos et al., 2013; Lopez Bernal, Gasparrini, Artundo, & McKee, 2013; Norström & Grönqvist, 2014; Simou & Koutsogeorgou, 2014). However, fewer studies have investigated the impact of the recession on health inequalities, the importance of welfare policies, and the individual health effects of unemployment. This thesis examines the effects of the Great Recession and generous welfare policies on population health and health inequalities in Europe, as well as mechanisms related to individual unemployment transitions.

1.1 The contribution of the thesis

This thesis investigates changing health and health inequalities during the Great Recession as well as the health effects of unemployment. Furthermore, the thesis analyses whether income and generous welfare policies mitigate these effects. All empirical analyses use longitudinal harmonized micro data for up to 28 countries, and all studies apply appropriate panel models to investigate these data. Such models enable the investigation of how individual health changes over time, providing more reliable estimates of the effects of exposure than do the time-series analyses, repeated cross-sectional studies, and control-for-baseline models (Allison, 2009; Gunasekara, Richardson, Carter, & Blakely, 2014; Morgan & Winship, 2007) on which studies of the health effects of unemployment and recessions are usually based (Frasquilho et al., 2016).

To investigate the impact of generous welfare policies on individual-level outcomes, the thesis integrates macro-level factors as explanations in longitudinal micro-level models. First, the thesis investigates whether the longitudinal trends in health are more favourable in countries with more generous welfare policies, as well as whether such a pattern is stronger during, compared with before, the Great Recession. Second, the thesis analyses whether the health effects of unemployment are less detrimental in countries with more generous welfare policies. Data on spending on unemployment benefits and in-kind services, including income replacement, training, goods, and services, were obtained from the European System of Integrated Social Protection Statistics (Eurostat, 2008). The generosity of welfare policies is defined as the amount of resources spent on people in need of these policies (following Dahl & van der Wel, 2013; Saltkjel, Dahl, & van der Wel, 2013).

The combination of micro- and macro-level data in longitudinal studies provides new insights, constituting a methodological advance in the field of comparative social policy research. It represents a possible way to investigate how various policies affect health, controlling for cultural differences in assessments.

1.2 Objective

Summarized, the objective of this thesis is to analyse the effects of the Great Recession and generous welfare policies on population health and health inequalities in Europe, as well as individual level mechanisms contributing to such effects. Consequently, this thesis addresses the following research questions:

1. What effects has the Great Recession had on health and health inequalities?
2. Have generous welfare policies mitigated any possible negative effects?
3. Whether and to what extent are individual unemployment transitions associated with deteriorating health? Furthermore, are such effects mediated by income and perceived economic situation or mitigated by the generosity of welfare policies?

The EU Statistics on Income and Living Conditions (EU-SILC) provide longitudinal data, including information on self-rated health (SRH) and employment status. By following individuals over time, it is possible to determine whether their SRH changes over time, whether exposure to unemployment is followed by deteriorating SRH, and whether income-related mechanisms can explain such health effects (Allison, 2009).

1.3 The Great Recession

In 2008 Europe entered a deep economic downturn, often called the "Great Recession" (Grusky, Western, & Wimer, 2011; Hetzel, 2009; OECD, 2014). This economic instability was originally triggered by defaults in the mortgage markets, caused mainly by real estate bubbles and unsustainable debt dynamics, and subsequently leading to sovereign debt crises (Lane, 2012; Longstaff, 2010). In almost all European countries, this economic instability resulted in recessions, defined as two successive quarters of negative economic growth, as (measured by gross domestic product (GDP), European Commission, 2009).[2] For the European Union (EU-28) as a whole, the recession started in the second quarter of 2008 and lasted until the third quarter of 2009 (OECD, 2016). This led to increasing unemployment rates throughout Europe (European Commission, 2009; OECD, 2014). The first increase in unemployment began in late 2008, when the overall unemployment rate in Europe was around 7 per cent. The unemployment rate increased in the first half of 2009, reaching 9.7 per cent in 2010. Unemployment rates were then stable until mid 2011, when they started to increase again, peaking at 12.0 per cent at the beginning of 2013 (see Figure 1, p. 8). Despite improvements in the labour markets since 2013, the rates of unemployment and involuntary part-time employment, particularly among younger cohorts, remain higher than the pre-recession levels.[3]

Employment is acknowledged as an important determinant of health (Marmot, Allen, Bell, Bloomer, & Goldblatt, 2012; Marmot et al., 2013). As health and well-being are assumed to be more closely related to unemployment and reduced income than they are to GDP (Krugman, 2012), this thesis uses the concept of *recession* as a generic term referring to severe economic downturns, while *the Great Recession* refers to the specific economic downturn that hit Europe in the years after 2008. Unemployment rates are used to proxy the severity of the Great Recession.

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[2] According to the change in quarterly growth rates of real GDP (using 2010 as the reference year, seasonally adjusted), the following countries experienced at least two successive quarters of negative growth between the first quarter of 2008 and fourth quarter of 2009: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom (OECD, 2016).
[3] Because of the time lag in producing the micro-level data, the current research focuses on the period before 2012.

Figure 1: Unemployment rates in EU-28; monthly, January 2008–February 2015
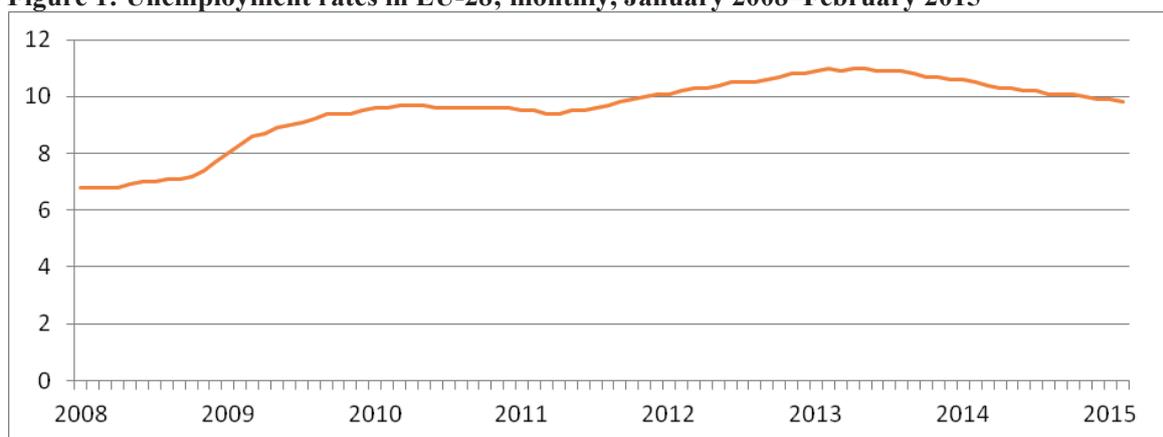
Source: OECD (2015b)

1.4 Recessions, unemployment, and health

Rising unemployment rates are of particular interest in this thesis as they arguably: a) are the main social consequence of the recession and b) cause deteriorating health for those affected (OECD, 2014, p. 11 and 28), i.e., *causal* health effects. Following Morgan and Winship (2007), causal effects are defined according to the counterfactual model of causality, that is, outcome after exposure compared with the exact counterfactual scenario in which exposure does not occur.

Becoming unemployed usually implies decreased income, but losing one's job is not only about income; it could also involve a loss of social identity or status, social contact, time structure, and regular activity (Fryer, 1986; Jahoda, 1982). All of these mechanisms could generate adverse health effects, so they all provide plausible explanations for the possible negative health effects of unemployment.

Nevertheless, disproportionately poor health among the unemployed compared with the employed is also generated by processes beyond the causal effects of unemployment on health. Poor health can be the reason for quitting work or being fired, which is referred to as *reverse causation* (Fergusson, McLeod, & Horwood, 2014). When companies downsize, such reverse causation is often referred to as "direct health selection", indicating that health is a factor in determining whether or not a person will be fired (Blane, Smith, & Bartley, 1993; West, 1991). Legislation often prohibits employers from direct health selection. Albeit with variation across countries, downsizing must usually be based on relevant criteria (Heggebø, 2015; Heyes, 2013); however, relevant individual characteristics, such as intelligence or motivation, could be associated with poor health. Nonetheless, it is important to emphasize

8

that none of these needs to be the explanation of the other. Underlying factors such as childhood disadvantages could cause both, in what is often referred to as *indirect health selection* (Catalano, 2009; Steele, French, & Bartley, 2013)

Both the causal health effects of unemployment on health and health selection into unemployment are likely to be affected by macro-level factors, such as employment regulations, health services, and social policies. Unemployment benefits and in-kind services probably reduce some of the negative effects of job loss (Karanikolos et al., 2013; Stuckler, Basu, Suhrcke, Coutts, & McKee, 2009a), while employment protection policies likely reduce the risk of being laid off or not being hired due to health-related characteristics (Heggebø, 2015; M. Virtanen et al., 2005a). Unemployment could also affect health beyond those who are directly exposed to it. Being employed in an area with increasing unemployment rates implies an elevated risk of becoming unemployed, which probably affects the stress levels of the still employed (Goldman-Mellor, Saxton, & Catalano, 2010; Kim & von dem Knesebeck, 2016; Sverke, Hellgren, Näswall, & Barling, 2002). Conversely, being unemployed in an area of high unemployment may imply less marginalization and stigmatization (Heggebø & Dahl, 2015). Various mechanisms connecting unemployment and health, and the possible impacts of macro-level contexts on these associations, illustrate the complex patterns causing health inequalities. This thesis investigates health inequalities at both the individual and aggregate levels. While studies I and II investigate the development of health inequalities during the Great Recession and how these inequalities vary across levels of welfare generosity, studies III–V investigate the impact of becoming unemployed on individual health.

1.5 The impact of generous welfare policies on health and health inequalities

Experiencing unemployment and economic difficulties increases the risk of poor living conditions and decreased well-being (Flint, Bartley, Shelton, & Sacker, 2013; McKee-Ryan, Song, Wanberg, & Kinicki, 2005; Strandh, 2000; Vansteenkiste, Lens, Witte, & Feather, 2005). Various welfare policies provide individuals with structures of social security that are supposed to counteract unfavourable life events (Esping-Andersen, 1990; Stephens, 2010). Such policies, for example, old age, sickness, and unemployment benefits, are prevalent in all European countries, though the institutional design and generosity of these policies varies between countries (Øverbye, 2015). The quality and generosity of these policies could be a

possible explanation of cross-national variation in the health risks associated with unfavourable exposures, including to unemployment (Bambra & Eikemo, 2009). To the extent that such policies mitigate the health effects of unfavourable exposures, they could also affect the social distribution of health at the societal level (Dahl & van der Wel, 2013; Saltkjel et al., 2013); for example, if generous unemployment benefits and services reduce the negative health effects of unemployment, they could contribute to reducing the health gap between the employed and unemployed.

2 Recessions, unemployment, and health

Before presenting theories of the possible mechanisms underlying the relationship between the Great Recession, unemployment, and health, the first section of this chapter introduces the most prominent theories of the relationships between health and social conditions at the micro level, emphasizing the main social consequence of recessions, namely, unemployment. The second section of the chapter explains how factors at the macro level, including economic fluctuations and the generosity of welfare policies, affect individual health. The final section of the chapter attempts to explain how macro-level conditions can affect health at the micro level. Understanding how the Great Recession and welfare policies translate into health requires that researchers include both micro and macro aspects in their analyses, as illustrated in Figure 2 (building on Whitehead, Burstrom & Didrichsen in Dahl, van der Wel, & Harsløf, 2010, p. 74).

Figure 2: The impact of labour market and welfare state arrangements on health
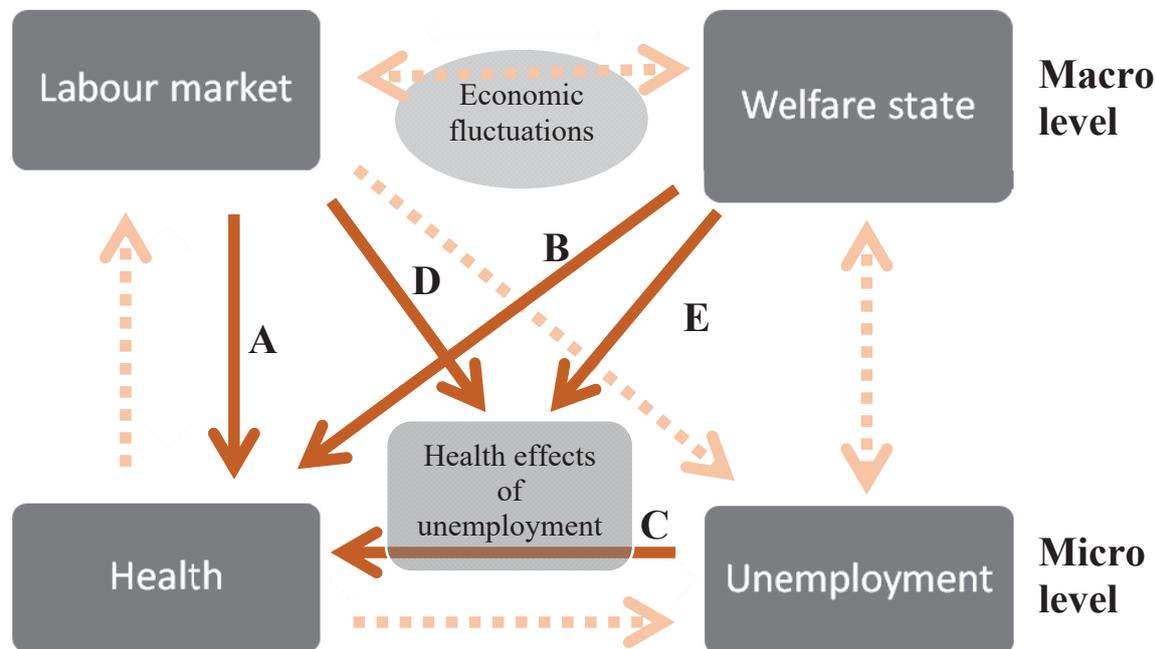
The upper part of the figure illustrates the macro level, while the lower part illustrates the micro level. All arrows within and between these levels illustrate potential mechanisms, i.e.,

11

explanations for how macro-level factors affect health (Elster, 2007). Dotted arrows indicate possible relationships that go beyond the scope of this thesis, including the possible effects of economic fluctuations on the design and function of the welfare state, the effects of the labour market on unemployment, and the impact of different populations' health compositions on labour market dynamics.

2.1 Micro-level theory

Employed people tend to be in better health than are their unemployed counterparts (Bartley, 1988; Ezzy, 1993; Jin, Shah, & Svoboda, 1995). At the individual level, these differences are often explained with reference to two broad categories of effects, causal effects and health selection effects.[4] Unemployment has a causal effect on health if its effect on health differs from that of being employed, for example, if becoming unemployed causes changes in health while staying employed does not (Bartley, Ferrie, & Montgomery, 2005; Flint et al., 2013). The mainstream assumption is that transitions into unemployment are harmful to health because employment provides social and financial security (Fryer, 1986; Jahoda, 1982). Loss of employment is therefore assumed to be a source of psychological stress (Bartley, 1994; Goldman-Mellor et al., 2010).

Economists tend to find the opposite: recessions and unemployment are good for public health, at least for most health outcomes. This finding is often explained by the physical grind and mental stress of labour and by exposure to unhealthy work environments, as well as by the positive behavioural effects of reduced income, including less consumption of alcohol and tobacco (Gerdtham & Ruhm, 2006; Ruhm, 2000, 2003, 2005, 2012). However, it is important to emphasize that these studies investigate the effects of economic fluctuations on public health, not the *individual* health effects of unemployment or economic recessions. While studies of the health effects of economic fluctuations investigate whether overall health, including health in the employed population, tends to change as the economy is changing, studies of the individual health effects of unemployment investigate whether exposure to unemployment leads to deteriorating health. Studies of the health effects of economic fluctuations apply intention-to-treat designs, and provide information on the population effects of a changing economic environment. Longitudinal studies of the individual health effects of unemployment enable individual-level quasi-experimental approaches, providing

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[4] In this thesis, causal effects are understood as differences derived from exposure or social conditions, i.e., exposure or social conditions as reasons for a deviating development.

information on the average-treatment effects of *actual* unemployment exposure (Böckerman & Ilmakunnas, 2009; Steele et al., 2013). As such, investigations of change in individual and aggregated macro data answer different questions. The health effects of the Great Recession in the general population could differ from the individual health effects of unemployment. It is also important to note that the most prevalent method used in studies of the health effects of economic fluctuations is time-series analyses. Time-series models are prone to bias due to the time-variant effects of economic downturns, which is a limitation when evaluating the health effects of the Great Recession. For instance, Ruhm (2015) identified a shift from beneficial health effects of economic downturns before 1990, to no or detrimental effects in the two decades after 1990.

Another explanation of weaker health in the unemployed than the employed is that of health selection, i.e., people in poor health have a higher risk of becoming and staying unemployed than do their healthier counterparts (Mastekaasa, 1996). This occurs if and when employers choose people with better health for work positions, while excluding people in poor health (Dahl et al., 2010, p. 42; van der Wel, Dahl, & Thielen, 2012). It is useful to distinguish between two related selection processes: *direct* and *indirect* health selection (Montgomery, Bartley, Cook, & Wadsworth, 1996).

Direct health selection (sometimes called reverse causation) implies that health contributes to social status (Blane et al., 1993; Elstad & Krokstad, 2003), with the healthier having increased probabilities of upward mobility, while those with poorer health have increased risks of downward social mobility. As a mechanism explaining the health difference between the employed and unemployed, downward mobility would imply that ill health causes unemployment, i.e., people become unemployed because of poor or deteriorating health. Direct selection therefore implies that people in poor health are more likely to experience job loss than are people in better health.

Indirect health selection implies that the increased risk of unemployment among people in poor health is due to underlying causes (Blane et al., 1993; Elstad & Krokstad, 2003; Steele et al., 2013); for example, genes and/or personal characteristics affect social mobility, which in turn affects health in adulthood (Dahl, van der Wel, & Bergsli, 2014, pp. 71-72). A distinction between direct and indirect health selection can be useful as an analytical perspective on health inequalities, though in "real life" it is almost impossible to distinguish between these mechanisms (Blane et al., 1993). An overall distinction between selection and causation is also problematic, as these are interrelated mechanisms (Bartley, 1988, 1994). Health in itself

affects proneness to various factors that in turn affect both health and employment prospects (Steele et al., 2013). Some studies indicate that people in poor health are particularly prone to the negative health effects of unemployment. If employers are more likely to dismiss workers with health problems, and if unemployment causes deteriorating health, causation and selection are interacting processes reinforcing health-related disadvantages (T. Korpi, 2001).

The distinction between causal health effects and health selection is in itself debatable. First, health selection processes are strongly affected by perceptions of certain health conditions, for example, obesity. Second, even "pure" direct health selection is initially socially determined, as the process takes place within a social framework; it is therefore driven by social actors and institutions (Dahl & Elstad, 2009).

2.2 Macro-level theory

In times of severe economic downturn, people probably experience elevated stress levels related to the possible consequences for their own employment and income situation (Frasquilho et al., 2016). Such stress is assumed to be mitigated by social policies, including generous unemployment benefits and services (Cylus, Glymour, & Avendano, 2014; Frasquilho et al., 2016; Suhrcke & Stuckler, 2012).

The initial economic conditions, the severity of the Great Recession, and the responses to it differ across Europe. Regarding the severity of the Great Recession, Greece, Spain, Portugal, Ireland, Cyprus, and Iceland suffered major decreases in GDP, while countries such as Poland, Norway, and Germany experienced hardly any change (OECD, 2010-2016). When it comes to welfare policies, schemes such as old age pensions, sick leave, and unemployment benefits are prevalent all over Europe, but have different institutional designs and levels of generosity (Øverbye, 2015). When a substantial economic downturn occurs, the impact of such policies could be particularly crucial for health (Stuckler & Basu, 2013; Stuckler, Basu, & McKee, 2010a; Stuckler, Basu, & McKee, 2010b; Stuckler et al., 2009a; Suhrcke & Stuckler, 2012).

2.2.1 Pro-cyclical and counter-cyclical theory

Whether macroeconomic booms and busts are good or bad for people's health is often distinguished by the concepts of pro- and countercyclical patterns. Procyclical patterns imply that recessions lead to the deterioration of public health, for example, through unemployment,

which increases economic uncertainty and stress (Dencker-Larsen, Holm, Kaerlev, Brødsgaard Grynderup, & Hansen, 2016). Countercyclical patterns imply better public health during economic recessions (Edwards, 2008; Haaland & Telle, 2013, 2015). Healthier diet combined with more leisure time and reduced exposures to hazardous working conditions are examples of mechanisms explaining such countercyclical relationships (Rajmil, Medina-Bustos, Fernández de Sanmamed, & Mompart-Penina, 2013; Suhrcke & Stuckler, 2012). Nevertheless, such pro- or countercyclical relationships at the macro level provide little or no information about experience at the micro level, as interpretations are susceptible to the ecological fallacy. For instance, positive correlations between unemployment rates and health could actually be due to increased health inequalities (Catalano, 1991; Dooley, Fielding, & Levi, 1996).

Unemployment rates differ greatly across European countries, in both levels and changes over time (Eurostat, 2016b; OECD, 2015a, 2015b). Both the health effects of unemployment and health selection into unemployment could be affected by such national differences, because they affect the composition of people entering unemployment (Heggebø & Dahl, 2015).

In addition, the demand for labour could affect both the health effects of unemployment and health selection into unemployment (Lundin, Lundberg, Hallsten, Ottosson, & Hemmingsson, 2010). Levels of and changes in unemployment rates have particularly strong impacts on health selection into unemployment, as the probabilities of employment and re-employment depend on the demand for labour (Bartley, 1988). When unemployment rates are low, people in poor health are more likely to be employed. If unemployment rates increase from a low level, there is a higher risk of health selection than if the unemployment rates increase from a higher level. In the latter case, people in poor health are less prevalent among the employed, as they are already unemployed or inactive (Heggebø, 2016; Heggebø & Dahl, 2015).

2.2.2 Counteracting the Great Recession

The health effects of the Great Recession and individual unemployment are also likely to be affected by the generosity and design of social policies (Karanikolos et al., 2013; Stuckler & Basu, 2013; Stuckler et al., 2010a; Stuckler et al., 2010b; Stuckler et al., 2009a), but huge debt burdens, lack of control over national budgets, and low or no economic growth have challenged social policy in the hardest-hit countries. The International Monetary Fund, European Commission, and European Central Bank ("the Troika") provided financial rescue packages to mitigate the negative effects of the Great Recession. However, these bailouts

were given subject to a precondition: the recipient countries needed to impose austerity policies, including spending cuts, tax increases, public sector privatization, and market deregulation, which in turn affected the countries' ability to provide generous welfare policies (Karanikolos et al., 2013; Maynou & Saez, 2016).

Because the processes and factors that predispose people towards unhealthy behaviour and worse health are unequally distributed (Marmot & Allen, 2014; Marmot et al., 2012), the impact of generous welfare policies should vary across groups. If generous welfare policies equalize the distribution of the social determinants of health in society, this would suggest decreased health inequalities (Dahl et al., 2010; Marmot & Wilkinson, 2005). A widespread hypothesis is accordingly that socioeconomically vulnerable populations are disproportionately at risk (Costa, Marra, & Salmaso, 2012; Frasquilho et al., 2016; McDaid et al., 2013). If collective resources compensate for the lack of individual resources, then generous welfare policies should have particularly strong positive effects in vulnerable groups.

2.3 Linking micro and macro

Figure 2 (p. 11) presents an analytical model illustrating the relationships between the health effects of unemployment, health selection into unemployment, and the impacts of economic fluctuations and welfare state characteristics.

Economic fluctuations will affect the labour market, for example, through labour supply and demand, the generosity and design of the welfare state, and the loan market and inflation. The effects of economic fluctuations on the welfare state can also be indirect, for example, as higher unemployment rates reduce tax income from labour and trade. At the same time, increased unemployment rates are expected to increase the demand for active labour market policies (ALMPs) and unemployment benefits.

Economic fluctuations could have a direct or indirect (through unemployment) effect on health and social conditions (arrow A in Figure 2). During recessions, the risks of unemployment and income reductions increase, which could generate stress and anxiety (Dencker-Larsen et al., 2016; Kim & von dem Knesebeck, 2016). These effects could operate independently of whether people are directly exposed to unemployment and income reductions if the concern relates to future conditions (Kim & von dem Knesebeck, 2016). Consequently, the effects of the Great Recession could be hard on everyone who experiences

it. However, these mechanisms could be even more prevalent in the more vulnerable populations, generating increased health inequalities (Marmot et al., 2008). On the other hand, social policies could operate as buffering mechanisms (arrow B in Figure 2), providing resources to individuals who no longer have access to work and psychological relief to those experiencing increased insecurity (Frasquilho et al., 2016). Study I in this thesis reviews current research into the effects of the Great Recession on health and health inequalities. Study II investigates whether and how self-reported health deteriorates and whether generous welfare policies have been particularly effective in countries hard hit by the Great Recession.

Fluctuations in unemployment rates could also affect "who's in" and "who's out" in the labour market. Periods of low unemployment rates imply a high demand for labour, which could provide opportunities for people who have challenges getting jobs when unemployment rates are higher. Nevertheless, when unemployment rates increase again, people in poor health have a higher risk of becoming unemployed, both because of the "first in, first out" principle in the labour market and because employers favour certain characteristics that correlate with health status, such as personality and cognitive abilities (Heggebø, 2015, 2016; Heggebø & Dahl, 2015). Different selection mechanisms are not explicitly addressed in the articles included in this thesis, but the overall impact of health selection is indirectly addressed in Study III.

Because the main social consequences of economic downturns are elevated unemployment rates, it is reasonable to hypothesize that recessions affect health through individual experiences of unemployment (arrow C in Figure 2). Study III investigates the average change in SRH as people become unemployed and in the time after their unemployment transition. However, the health effects of individual experiences of unemployment could also be heterogeneous, i.e., stronger effects in vulnerable groups. Therefore, this study investigates differences in effects across educational levels, gender, and age groups.

Furthermore, the effects of unemployment on health depend on several macro-level phenomena (Suhrcke & Stuckler, 2012). The health effects of unemployment could also depend on the prevalence of the phenomenon (arrow D in Figure 2). In aggregate, the unemployed tend to be healthier when unemployment rates are high (Heggebø & Dahl, 2015), which is sometimes interpreted as indicating that unemployment is less stressful when more people are sharing the experience. However, such an interpretation could be somewhat misleading. When unemployment rates are high, unemployment exposure is more random, so selection into unemployment is less prevalent (Heggebø & Dahl, 2015). People who become

unemployed when unemployment rates are high could therefore feel less discriminated against by employers, and externalize rather than internalize the cause of their unemployment, i.e., blame others (e.g., politicians or the economic climate) rather than themselves. The ability to externalize the cause of employment could function as a buffer, making people more resilient to the negative health effects of unemployment. Study IV of this thesis investigates whether the health effects of unemployment are less pronounced when unemployment rates are increasing. Furthermore, the health effects of unemployment could depend on the generosity of welfare policies (arrow E in Figure 2). If generous services and benefits enable the unemployed to maintain their standard of living, becoming unemployed could have a minimal effect on health. This hypothesis is investigated in study IV.

Overall, Figure 2 illustrates how both the labour market (through selection and causation) and the generosity of welfare policies can affect health directly or through their effects on social conditions, for example, by providing the unemployed with sufficient resources to control their lives and maintain a decent standard of living.

2.4 Causality and mechanisms

The overall objective of this thesis is to analyse the effects of the Great Recession and generous welfare policies on population health and health inequalities in Europe, but it also aims to identify possible mediating and mitigating factors. The research also explores the extent to which individual unemployment transitions are associated with deteriorating health. Furthermore, this thesis investigates whether and how changes in household financial conditions explain the health effects of unemployment, as well as whether generous unemployment benefits and services mitigate any possible negative effects. This thesis thereby addresses the causal health effects of a severe recession and individual unemployment, as well as investigating possible explanations at both the micro (i.e., household finances) and macro (i.e., welfare policy generosity) levels. The definitions of and requirements for mechanisms and causal inference must therefore be discussed.

Because one person cannot both be exposed and not exposed to a potential cause at a given time, it is difficult to determine the true counterfactual outcome (Elster, 2007; Morgan & Winship, 2007). What would have happened if the person had not been exposed? For a given person, it is impossible to conclude whether the exposure caused the effect or whether it was caused by confounding factors (Elster, 2007; Morgan & Winship, 2007). Furthermore, the

effect of a given exposure can vary from one person to another. In the case of this thesis, the emotions and social consequences produced by an external exposure, for example, macroeconomic recessions or unemployment experience, will differ between both people and social groups (Delpierre et al., 2011; Delpierre et al., 2012; Hedström & Ylikoski, 2010; Strandh, 2000). Because of the lack of empirical regularities, in this thesis causality is not understood as *covering* or *general* laws (Elster, 2007; Hedström & Ylikoski, 2010), but rather as what Elster (2007) referred to as *weak* laws: "For any change (up or down) in the independent variable they allow us to predict the direction or the sign of a change (up or down) in the dependent variable" (Elster, 2007, p. 36).

Nevertheless, at the aggregate level, it is still possible to ask what would have happened if a subject had not been exposed by applying a counterfactual model of causality. One can thereby investigate whether an exposure has a causal effect on the *risk* of a given outcome by investigating a population of individuals. Each person is allowed two alternative scenarios: being exposed and not being exposed. When only these two scenarios are considered and the groups are otherwise similar, the additional development in the exposed group is assumed to be the effect of the exposure (Morgan & Winship, 2007). In this thesis, the counterfactual model of causality is operationalized as econometric causality (Heckman, 2008). The average change in a group of exposed individuals is compared with the average change in a group of non-exposed individuals. The allocation between the groups is quasi-randomized by controlling for differences.

In addition to *whether* the Great Recession and individual unemployment cause health deterioration, this thesis investigates *how* this might occur, i.e., the causal mechanisms through which the Great Recession and individual unemployment might cause health to deteriorate (Hedström & Ylikoski, 2010) – or as Elster (2007) put it, the "causal story" of how the effects are generated. Following Hedström and Ylikoski (2010), the underlying assumption in this thesis is that the mechanisms can be observed and only need to affect the probability of a given effect. The final discussion (pp. 53–64) will be based on these ideas.

3 Previous research

In recent decades, hundreds of studies have investigated the impact of unemployment and economic fluctuations on various health outcomes in a wide range of populations and contexts. In general, this research can be separated into two broad categories: micro- and micro–macro-level studies. While micro-level studies investigate the relationship between health and various determinants, exposures, or risks at the micro level, micro–macro-level studies are a special line of comparative research in which outcomes and relationships at the individual level are explained by macro-level factors. To allow an overview of the research in this field, the following section will summarize the findings of literature reviews, meta-analyses, as well as repeated cross-sectional, longitudinal, and quasi-experimental studies. Cross-sectional studies are excluded, as cross-sectional designs seriously limit causal interpretations (Frasquilho et al., 2016; Morgan & Winship, 2007). The literature review starts by recapitulating the relationship between health and unemployment at the individual level, before reviewing studies of micro–macro relationships.

3.1 Micro-level studies

The Great Recession has led to elevated unemployment rates. From 2008 to 2013, the unemployment rate in Europe rose from 6.8 to 10.9 per cent, i.e., equivalent to an expansion of the number of unemployed by ten million people. If individual unemployment harms health, increased unemployment rates could possibly explain the health effects of the Great Recession. Individual-level studies of transitions between employment and unemployment provide insight into the causal health effects of unemployment and the health selection mechanism. However, it is important to keep in mind that these studies have been conducted independently of recessions. Whether the effects are similar during the Great Recession remains to be seen.

3.1.1 Health selection

Systematic reviews, meta-analyses, and syntheses of evidence find that people in poor health have an elevated risk of becoming unemployed, i.e., these studies identify health selection into unemployment (Kröger, Pakpahan, & Hoffmann, 2015). Using various indicators of health, T. Korpi (2001), P. Virtanen, Janlert, and Hammarström (2013), and Kaspersen et al.

(2015) found that people in poor health are more likely to become and remain unemployed than are those who are healthier. Indicators such as SRH (Elstad & Krokstad, 2003; P. Virtanen et al., 2005b), psychological distress (Mastekaasa, 1996), self-reported health symptoms (T. Korpi, 2001), and longstanding illness (Arrow, 1996) are all found to predict unemployment. A recent study of health selection to unemployment discovered that the selection effect has been reinforced lately in Europe, particularly in countries hard hit by the Great Recession (Reeves, Karanikolos, Mackenbach, McKee, & Stuckler, 2014). Data from Great Britain indicate that during recessions, people in poor health have an elevated risk of job loss (Minton, Pickett, & Dorling, 2012). Analyses of data on 28 European countries in 2007 and 2011 indicate the opposite, however: poor health is a weaker predictor of unemployment in those countries that were severely hit by the Great Recession (Heggebø & Dahl, 2015). The discrepancy could be due to the gradual compositional change of the groups of employed and unemployed: if health selection into unemployment is prevalent, then progressively fewer people in poor health will remain employed as the unemployment rate increases until, at a certain point, dismissal becomes more or less random. Similar health selection processes are found to be prevalent during periods of economic recovery: unemployed people in poor health have a lower probability of re-employment than do their counterparts in better health (Minton et al., 2012). Both P. Virtanen et al. (2013) and T. Korpi (2001) found that poor SRH increases the risk of becoming and remaining unemployed in Sweden, and Schuring, Burdorf, Kunst, and Mackenbach (2007) arrived at similar findings for 12 European countries.

Studies indicate that people in weak socioeconomic positions are at increased risk of indirect health selection into unemployment (Lindholm, Burström, & Diderichsen, 2001; Van de Mheen, Stronks, Schrijvers, & Mackenbach, 1999). In Germany, Arrow (1996) found that immigrants, women, young adults, and previously unemployed people are at particularly high risk of health selection into unemployment. In their 12-country study, Schuring et al. (2007) found an elevated risk of health selection among unmarried women, parents of young children, elderly people, and low-income groups. Furthermore, low education and poor health increase the risk of remaining unemployed (Bartley & Owen, 1996; T. Korpi, 2001; van der Wel, Dahl, & Thielen, 2011). All of these studies suggest indirect health selection.

Disentangling direct health selection from social selection requires sophisticated methods, as neither health nor social position can or should be randomized. Using a simultaneous equation model, Steele et al. (2013) found limited evidence for direct health selection, but strong

evidence for indirect selection, as unmeasured individual factors are associated with higher risks of both unemployment and poor health.

3.1.2 Causal effects

In general, unemployment is found to cause deteriorating health, particularly mental health (Dencker-Larsen et al., 2016; Flint et al., 2013; Gebel & Voßemer, 2014; Goldman-Mellor et al., 2010; McKee-Ryan et al., 2005; Steele et al., 2013; van der Noordt, IJzelenberg, Droomers, & Proper, 2014). In a review of longitudinal studies of how health changes when unemployment occurs, Catalano et al. (2011) found that people who become unemployed are twice as likely to experience increased symptoms of depression and anxiety as are those who remain employed. On average, job losers tend to report 15–30 per cent more symptoms, suggesting a possible causal link between unemployment and health.

There is also a substantial amount of research into the health effects of income, which is a highly relevant matter, as reduced income is assumed to mediate the health effects of unemployment (Huijts, Reeves, McKee, & Stuckler, 2015; Marmot, 2002). Most of this research uses cross-sectional data. In a systematic review of the effects of income on SRH, Gunasekara, Carter, and Blakely (2011) found 13 longitudinal studies based on five different data sources. Eight of these studies found a small, but statistically significant, positive health effect. The meta-analyses suggest that a one-unit increase in log income typically corresponds to a one per cent increase in SRH.[5] Overall, the reviewed studies found that average income had much larger health effects than did income change. This could imply either that income levels are more important than income fluctuations, or that underlying factors cause both good health and high income levels. Furthermore, relative poverty, i.e., being low in the national income distribution, is associated with weaker health than that of the general population, including in terms of mortality among infants, children, and adults (Bergqvist, Yngwe, & Lundberg, 2013, p. 7). Some studies indicate that financial strain mediates the effect of unemployment on mental health (Catalano et al., 2011), while others indicate that economic difficulties make individuals reluctant to seek medical assistance (Elstad, 2016; Stuckler et al., 2010a; Stuckler, Basu, Suhrcke, & McKee, 2009b).

To the extent that unemployment causes deteriorating health, this health disadvantage is not necessarily erased by re-employment. Using the General Health Questionnaire (GHQ), a screening device for mental health, Flint et al. (2013) found that transitions from

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[5] Two further studies found an effect on mental health, but not on SRH.

unemployment to employment were associated with less health improvement than the health deterioration associated with transitions from employment to unemployment. A possible explanation could be that the jobs that people left were more secure than those gained after the unemployment spell (Halvorsen, 1998; Kim & von dem Knesebeck, 2016).

When investigating mental health effects, most studies find that older workers are more prone to the health effects of unemployment than are younger workers. In fact, several studies suggest no negative health effects among younger workers (Goldman-Mellor et al., 2010). It has also been hypothesized that men are more prone to the negative mental health effects of unemployment than are women, though most empirical studies do not find such differences (Catalano et al., 2011; Goldman-Mellor et al., 2010). Generally, there is an educational gradient in health (Marmot et al., 2010), with more education being associated with better health (Eikemo, Huisman, Bambra, & Kunst, 2008c; Marmot et al., 2012). Edwards (2008) found that less-educated people experience stronger negative health effects from rising unemployment rates. However, whether this is due to the stronger negative health effects of becoming unemployed among the less educated is not investigated.

Unemployment transition is an individual life event, but it affects members of the families of the unemployed as well. A literature review indicates that children are particularly vulnerable to health effects during recessions (Frasquilho et al., 2016), but more longitudinal studies are needed to gain a better understanding of these effects. Other studies have highlighted the impact on the partners of the unemployed. Analysing the Office of Population Censuses and Surveys' (OPCS) longitudinal study, Moser, Jones, Fox, and Goldblatt (1986b), Moser, Goldblatt, Fox, and Jones (1987), and Moser, Fox, Goldblatt, and Jones (1986a) found higher levels of mortality among spouses and other women in the households of unemployed men. Similar results are found regarding mental health: the unemployment transition affects psychological well-being in both the person directly exposed to unemployment and that person's partner (Marcus, 2013).

Panel models can be contaminated by direct health selection, i.e., when a sudden health decline precedes unemployment, or indirect selection, i.e., when a third factor affects both outcomes. For these reasons, some analysts believe that plant closures or major layoffs are better indicators of true causal effects than are instances of individual unemployment (Jin et al., 1995; J K Morris & Cook, 1991). Schmitz (2011) found a greater decline in health among people unemployed for individual reasons than among people unemployed due to closures or mass layoffs. Schmitz (2011) argued that the divergent results for the two groups are due to

direct and indirect health selection, i.e., that when people are being laid off systematically, people in poor or deteriorating health, or with characteristics associated with poor health, are at higher risk of being laid off. However, there could be alternative explanations of the different results, including divergent feelings associated with the two ways of becoming unemployed. Unemployment due to downsizing and individual job terminations could be perceived as the result of one's own inadequate job performance or other unattractive individual characteristics (Mastekaasa, 1996). Such internalization of the cause of unemployment could be more harmful to health than externalizing the cause, i.e., blaming someone beyond oneself, which is more likely in situations of closures or major layoffs. This implies that Schmitz (2011) found no causal health effects of closures or major layoffs, though the study does not refute the possibility that downsizing may have causal health effects.

A systematic review and meta-analysis of the relative importance of health selection and the causal health effects of unemployment in explaining health inequalities suggests that both mechanisms play a role (Kröger et al., 2015). The exact results of the included studies vary: five studies indicate that the causal effects are the most important, while six indicate that health selection is the most important and two that both are equally important. When testing these two hypotheses against each other, studies applying better methods and designs for causal inference more frequently find health selection to be the strongest mechanism, while studies of poorer quality more frequently favour causal health effects (Kröger et al., 2015).

Despite uncertainty regarding the relative importance of these mechanisms, Kröger et al. (2015) suggested that both health selection and causal health effects are prevalent, i.e., an elevated risk of unemployment among people in poor health and negative health effects of unemployment (Claussen, 1999). This interplay of causal and selection mechanisms is sometimes referred to as accumulating disadvantages or the co-evolution of health and unemployment (Bartley & Plewis, 2002; T. Korpi, 2001). Moser et al. (1986b) found that those who were unemployed at the start of the panel (1971) were more likely to experience further unemployment spells, marital dissolution, downward social mobility, and loss of self-owned housing. Investigating the other direction, Bartley and Plewis (2002) found that the unemployed are at a higher risk of future limiting longstanding illness. T. Korpi (2001) and P. Virtanen et al. (2005b) investigated both directions, and found that people with health problems have an elevated risk of future unemployment and re-employment, while people with previous unemployment experience are more prone to deteriorating health.

3.2 Macro-level studies

In the overall population, economic downturns are often found to coincide with improved physical health (Gerdtham & Ruhm, 2006; Neumayer, 2004; Ruhm, 2000, 2003, 2005, 2012). However, most studies of the public health effects of economic downturns apply various forms of time-series analysis. Regarding mental health, economic downturns are associated with elevated levels of poor mental health (Neumayer, 2004; Ruhm, 2000), supporting the typical finding of individual-level studies, i.e., that unemployment is bad for mental health (Goldman-Mellor et al., 2010).

These results are generated from time-series analyses. The problem with these analyses is that they are driven by long-term trends. If the trend changes, for example, because of a *short*, *deep* recession, which has different effects from those of economic fluctuations, this brief deviation will have a minor impact on the estimates. Ruhm (2015) acknowledged this shortcoming. During the 1991–2010 period, only deaths from cardiovascular disease and transport accidents were found to decrease when unemployment rates increased, while mortality for other reasons increased or remained unchanged. Ruhm (2015, p. 27) concluded that "the procyclicality of mortality might have increased slightly in the most recent analysis periods, that include the severe 2007–2009 recession". Furthermore, these studies estimate only the overall effect on public health; health inequalities are usually not addressed.

3.2.1 Health effects of the Great Recession

Overall, the research literature suggests that the Great Recession has had negative health effects (Falagas, Vouloumanou, Mavros, & Karageorgopoulos, 2009). Mortality has increased in Spain (Benmarhnia et al., 2014; Maynou, Saez, & Lopez-Casasnovas, 2014) and Greece (> 55 years, Vlachadis, Vrachnis, Ktenas, Vlachadi, & Kornarou, 2014), two of the hardest-hit countries. Since the onset of the Great Recession, elevated suicide rates have been reported from several countries (Chang, Stuckler, Yip, & Gunnell, 2013; Reeves, McKee, & Stuckler, 2014), including Greece (Antonakakis & Collins, 2014), Italy (Pompili et al., 2013), Spain (Lopez Bernal et al., 2013), and Ireland (Walsh, 2011). Although these studies use aggregated data, they apply specific measures of the Great Recession. Some studies have contested the effect on suicide (see, e.g., Granados (2014); Regidor, Barrio, Bravo, and de la Fuente (2014)), though these studies have not corrected for the pre-recession trend.

Quasi-experimental studies indicate that the Great Recession has led to a higher prevalence of poor SRH (Hessel, Vandoros, Avendano, & Vandoros, 2013; Vandoros, Hessel, Leone, & Avendano, 2013). Hessel et al. (2013) and Vandoros et al. (2013) provided robust estimates, as they apply a difference-in-difference design. Their studies compare health trends in two countries that had similar health trends before 2008 (i.e., Ireland and Greece (Hessel et al., 2013) and Poland and Greece (Vandoros et al., 2013)), but were differently exposed to the Great Recession. Divergent health trends in the two countries after 2008 can therefore be interpreted as caused by the Great Recession.

A systematic review of pre-post studies, including both cross-sectional and longitudinal studies, reveals a consistent worsening of mental health (Frasquilho et al., 2016), as self-reported mental distress, common mental disorders, and suicidal behaviour all increased in prevalence. Some studies also find increased substance-related disorders during the Great Recession (Frasquilho et al., 2016), but only one of these studies was conducted in Europe (i.e. a study from Spain, Gili, Roca, Basu, McKee, & Stuckler, 2013), making it difficult to draw consistent conclusions. However, for mental health in general, repeated cross-sectional studies indicate a deteriorating trend (Agudelo-Suárez et al., 2013; Astell-Burt & Feng, 2013; Bartoll, Palencia, Malmusi, Suhrcke, & Borrell, 2014; Economou, Madianos, Peppou, Patelakis, & Stefanis, 2013a; Economou et al., 2013b; Frasquilho et al., 2016; Urbanos-Garrido & Lopez-Valcarcel, 2014). A possible mechanism explaining such effects is increased psychological distress. Investigating fluctuations in levels of cortisol, often referred to as the stress hormone, Dencker-Larsen et al. (2016) found a disproportionately negative trend among the unemployed, especially among those who do not participate in the ALMPs.

Regarding health measures beyond mental health, repeated cross-sectional studies suggest deteriorating SRH (Reile, Helakorpi, Klumbiene, Tekkel, & Leinsalu, 2014; Vandoros et al., 2013; Zavras, Tsiantou, Pavi, Mylona, & Kyriopoulos, 2013), more work-related stress (Houdmont, Kerr, & Addley, 2012), increased risk of cardiovascular diseases (Ásgeirsdóttir, Ólafsdóttir, & Ragnarsdottir, 2014b; Astell-Burt & Feng, 2013), respiratory diseases (Astell-Burt & Feng, 2013), and low birth weight (Eiríksdóttir et al., 2013), as well as worse health behaviours, including decreased consumption of fruit and vegetables (Ásgeirsdóttir et al., 2014a; Filippidis et al., 2014) and increased consumption of alcohol- (Ásgeirsdóttir et al., 2014a; Harhay et al., 2013) and sugar-containing beverages (Ásgeirsdóttir et al., 2014a). However, there are also improvements: people are more physically active (Filippidis et al., 2014), consume more fish oil (Ásgeirsdóttir et al., 2014a), and are less likely to smoke

(Ásgeirsdóttir et al., 2014a; Filippidis et al., 2014; McClure, Valdimarsdóttir, Hauksdóttir, & Kawachi, 2012; Ólafsdóttir, Ásgeirsdóttir, & Hrafnkelsson, 2014).

Some of the repeated cross-sectional studies identify public health effects of the Great Recession that deviate from the effects on specific subgroups. For example, a comparison of 2006–2007 and 2008–2009 in England indicates a general reduction in the number of people who drink alcohol, how often they drink, and how much they drink, while binge drinking increased among the unemployed (Harhay et al., 2013). Findings are similar regarding low birth weight, poor mental health, and suicidal ideation: there is an increased risk in the population on average, but an even stronger increase among the unemployed (Agudelo-Suárez et al., 2013; Bartoll et al., 2014; Economou et al., 2013b; Eiríksdóttir et al., 2013). Bonaccio et al. (2014) found a decreased prevalence of the Mediterranean diet in Italy, the reduction being stronger among the low educated, manual workers, and people with low income than among the average population. A longitudinal study from Iceland has also demonstrated that the income gradient in health became steeper after 2007 (Ásgeirsdóttir & Ragnarsdóttir, 2014). Summarized, these studies indicate that the Great Recession led to increased health inequalities. However, some results do not follow this pattern. Investigations of trends in a broad range of health outcomes do not indicate increasing health inequalities in the United Kingdom (Astell-Burt & Feng, 2013; Katikireddi, Niedzwiedz, & Popham, 2012). In Estonia and Finland, low-educated women reported improved SRH (Reile et al., 2014), and the situation was similar in Greece, where the Great Recession was accompanied by a reduced educational gradient in mental health (Economou et al., 2013a; Economou et al., 2013b). The explanation for these divergent results may be several, including contextual factors, sampling, and methods.

The health effects of the Great Recession are suggested to be partly due to increased uncertainty about the future, including increased job insecurity (Falagas et al., 2009). Several meta-analyses and reviews have addressed the health impacts of temporary employment and job insecurity, finding negative health effects (Bambra et al., 2010a; Frasquilho et al., 2016; Sverke et al., 2002; M. Virtanen et al., 2005a). Such effects can be as detrimental as unemployment (Halvorsen, 1998; Kim & von dem Knesebeck, 2016), particularly to mental health (Frasquilho et al., 2016; Goldman-Mellor et al., 2010; Kim & von dem Knesebeck, 2016). Job insecurity is associated with an almost 30 per cent increase in depressive symptoms (Kim & von dem Knesebeck, 2016), and the mental health effect of moving into an insecure work position could be almost as detrimental as becoming unemployed (Goldman-

Mellor et al., 2010). Nevertheless, the health effects of job insecurity could take time to manifest (Kim & von dem Knesebeck, 2016; OECD, 2014; Sverke et al., 2002), suggesting that life-course studies are more appropriate for investigations of this mechanism than are short longitudinal panels.

3.2.2 The impact of generous welfare policies

Although the design, combination, and generosity of welfare policies vary across Europe, these policies normally target populations in particular need of resources. Welfare state design and generosity are therefore assumed to affect the relationship between social risks and health (Marmot et al., 2012; Marmot et al., 2013), particularly during recessions (Catalano, 2009).

Reviewing studies of welfare state characteristics and health inequalities, Bergqvist et al. (2013) found better health in countries where welfare policies are more generous. A systematic review of the impact of recessions on the transmission and control of communicable diseases supports this finding: spending cuts have increased the risk of syphilis, tuberculosis, and genitourinary infections (Suhrcke et al., 2011). Applying a state fixed-effects analysis of macro data, Cylus et al. (2014) investigated the effect of unemployment rates on suicide. The results indicate a negative additive interaction between the generosity of benefit programmes and unemployment rates, suggesting that generous unemployment benefits buffer the negative mental health effects of economic downturns. Using equivalent methods, Stuckler et al. (2009a) found that investments in ALMPs reduced the adverse short-time effects of economic downturns on suicides. These studies indicate that generous welfare states not only improve health among those directly hit, but also in the general population.

However, generous welfare policies could reduce health inequalities (Bergqvist et al., 2013; Marmot et al., 2008). Kunst et al. (2005) compared health inequality outcomes in countries with different responses to economic downturns. During the economic downturn in the 1980s and 1990s, most European countries had stable but high social inequalities in self-perceived health. The Nordic countries served as an exception with a decreasing trend (Kunst et al., 2005), suggesting that their social policies served as a buffer against the negative health effects of macroeconomic fluctuations.

A multi-level analysis of birth weight and infant mortality in OECD countries during the 1960–1998 period found that Social Democratic countries (i.e., Sweden, Norway, Denmark, and Finland) had significantly lower infant mortality and low-birth-weight rates than did three

other clusters of countries, i.e., (Christian Democratic; Liberal; and Wage Earner welfare states, Chung & Muntaner, 2007). This finding was supported by Lundberg et al. (2008), whose time-series analyses of 18 OECD countries from 1970 to 2000 found that generous support of dual-earner families was associated with lower infant mortality rates. On average, there were 0.04 fewer deaths per 1000 births for each percentage point increase in dual-earner support.

Several studies have identified effects of income and poverty on health (Bergqvist et al., 2013; Costello, Compton, Keeler, & Angold, 2003; Huijts et al., 2015; Marmot, 2002; Stuckler et al., 2010b), suggesting that generous welfare policies affect health through their effect on income.

3.3 Conclusion

In general, studies of the Great Recession find that it has had negative health effects, particularly on mental health. Studies measuring the effects of social policies find positive health effects, though studies of whether the impacts of social policies have been stronger during the Great Recession than in the pre-recession period are scarce.

Compared with the many studies of the public health effects of the Great Recession, few studies investigate whether these effects vary across social groups. Those that do generally find that the health effects of the Great Recession have been more pronounced in vulnerable groups, suggesting that health inequalities have increased. Some of these studies find that the unemployed are particularly affected. Combined with evidence regarding the causal health effects of unemployment, this suggests that unemployment could have accounted for some of the health effects of the Great Recession. Nevertheless, few individual-level studies have been conducted during the Great Recession, and the effect sizes could differ between this and the pre-recession periods.

The research literature demonstrates that income and generous welfare policies have positive health effects, though the mechanisms among unemployed remain unclear. One promising hypothesis is that generous unemployment benefits and services buffer against income reductions when people become unemployed, which could affect health. Welfare generosity could thereby counteract the negative health effects of unemployment.

Following these insights, four areas for further exploration in this thesis become clear.

First, several studies investigate the effects of the Great Recession on population health, and others also investigate whether the Great Recession has affected health inequalities. Nevertheless, it is difficult to get an overview of this field, due to pluralism in the research designs, statistical methods, and health outcomes used. To obtain a more precise and current picture of the impact of the Great Recession on population health and health inequalities, studies addressing one or both of these issues should be systematized and reviewed.

Second, most studies of the health effects of the Great Recession investigate the effects on public health, while only a minority examines the effects on health inequalities. There is a need for further investigation of the association between various socio–economic indicators and health, and of whether the Great Recession has affected such relationships.

Third, there is scarce evidence regarding the health effects of various socio–political arrangements and to what extent they counteract the negative health effects of the Great Recession. Empirical investigations of the hypotheses concerning the buffering effects of welfare design and specific policy responses are therefore needed.

Fourth, more studies are needed to evaluate the specific mechanisms by which the Great Recession has generated health effects, including individual unemployment transitions and declined income. Following Frasquilho et al. (2016), Kröger et al. (2015), and McKee-Ryan et al. (2005), studies should apply data and methods that allow for analyses of causal inference, i.e., minimize bias due to selection.

4   Methodology

The objective of the thesis is to investigate the effects of the Great Recession and generous welfare policies on population health and health inequalities in Europe. The thesis consists of a literature review of the relationship between the Great Recession, public health, and health inequalities, as well as four empirical articles studying changes in SRH before and during the Great Recession, including among people who experienced unemployment transitions. Indirectly, the thesis also investigates selection processes by comparing the health gap between employed and unemployed individuals with health changes before and after entering unemployment.

4.1   Scoping review

Study I is a scoping review, which, compared with systematic reviews, is a less comprehensive and more exploratory way to review the research literature. This lack of rigidity is due to the objective of the review, which is to map research questions, theoretical perspectives, methodological approaches, and results. Such an approach can be useful when the relevant literature is scarce or too diverse to answer a specific question and to permit assessment of the quality of each study (Levac, Colquhoun, & O'Brien, 2010).

Although there is no clear definition of what constitutes a scoping review (Levac et al., 2010), Arksey and O'Malley (2005) formulated a five-step description of the methodology, which was applied in Study I. First, we identified the research question. Following Levac et al. (2010), we used a broad research question combined with a clearly defined scope. Second, we identified relevant studies through a defined search plan. Third, two of the authors read the identified titles and abstracts and excluded studies considered beyond the scope of the review. Fourth, all the remaining studies were charted according to country of inquiry, research design, health outcome, socio–economic indicators, population health results, and health inequality results. In the fifth and final step, we sorted, summarized, and reported the results.

Given the exploratory nature of scoping studies, inclusion of all relevant studies implies that the search strategy and inclusion criteria must be flexible. Obviously, the disadvantage of this lack of rigidity is that study selection can be biased due to the researchers' personal beliefs.

We believe that the broad composition of authors, in combination with peer review, has minimized this risk.

4.2 Longitudinal data from EU-SILC

The longitudinal panel data from the European Union Statistics on Income and Living Conditions (EU-SILC) are the main source of micro data investigated in this thesis (see Appendix 2 for a link to metadata and information on all EU-SILC target variables). Panel data provide multiple observations of units over time, and thereby allow the estimation of more complex models than do macro-level time-series or individual cross-sectional data, giving statistical control over all time-constant factors, even unobserved ones (Allison, 2009; Kröger et al., 2015). Panel data, combined with longitudinal methods, are therefore increasingly used to mimic natural experiments, i.e., random exposures (Morgan & Winship, 2007), thereby providing promising prospects to estimate causal effects (Finseraas & Kotsadam, 2013; Morgan & Winship, 2007, p. 251; Tufte, 2013a, 2013b).

EU-SILC data are investigated in studies II–V (Abebe, Tøge, & Dahl, 2016; Tøge, 2016a, 2016b; Tøge & Blekesaune, 2015). One advantage of panel data is that they permit the estimation of temporal changes, i.e., the change in one factor (e.g., health) as a function of other time-variant factors (e.g., employment). Analysing such temporal relationships between variables provides stronger empirical support for causal interpretations of the data than do more traditional methods (Morgan & Winship, 2007). Furthermore, panel models can compare subpopulations, enabling investigations of the divergent impacts of life events on health in different countries and in different social groups (e.g., educational levels).

EU-SILC is a rotational panel, providing up to four observations of each respondent over a four-year period. Furthermore, the panel provides monthly information on activity status (including whether the person is employed or unemployed) over the previous 12 months. The 2008–2011 panel, which is used in studies II–V, provides 1,050,842 yearly observations of 420,184 individuals from the EU-28 (excluding Germany and Ireland) plus Norway and Iceland. Study II also uses data from the pre-recession period (2005–2007).

4.2.1 Self-rated health

This thesis investigates health status, using self-rated health (SRH) as a measure: "How is your health in general: would you say it was very good, good, fair, bad, or very bad?" Study II

analyses SRH on an ordinal scale, investigating the probability of good (vs. fair or bad) and fair (vs. good or bad) health. Studies III–V apply a continuous scale, investigating the probability of a linear change in SRH. Treating SRH as an ordinal variable implies taking the ranked scale into account, but still acknowledging the lack of measureable distance between the alternative responses. The advantage of treating SRH as a linear scale is that changes between all levels contribute to the estimates, not only crossing defined thresholds. This feature is particularly important in longitudinal analyses, as people's health tends to be very stable over time. Furthermore, treating SRH as a linear scale makes it easier to compare estimates across models (Mood, 2010).

As a health measure, SRH indicates how individuals perceive their own health (illness, see Twaddle, 1994) and is therefore a subjective health measure. Subjective measures are those reported by the individual, whereas objective measures are the outcome of health worker investigation, blood samples or in other ways more directly observed (Sullivan, 2003; Ware et al., 1981). Compared with objective health measures, subjective measures have received increased acknowledgment over the last few decades (Sullivan, 2003; Ware Jr, Brook, Davies, & Lohr, 1981). There are two reasons for this development. First, there has been a shift towards acknowledging individual perceptions of health, as the most complete and meaningful picture of individual health status can be obtained from the person concerned (Sullivan, 2003). As Sen (2002, p. 860) put it: "For sensory assessment, the priority of the internal view can hardly be disputed – for example, pain is quintessentially a matter of self perception. If you feel pain, you do have pain, and if you do not feel pain, then no external observer can sensibly reject the view that you do not have pain". Second, as life expectancy has increased, there has been a shift from longevity to symptom control and quality of life (Sullivan, 2003). Death prevention is of course still a priority, but "it is no longer a sufficient or self-evident goal for medical care" (Sullivan, 2003, p. 1596), as one should also have a good life. In sum, emphasizing individual health perceptions, symptom control, and quality of life has caused an epistemological transition from bodily functioning to subjective health as the objective of scientific study (Sullivan, 2003).

SRH is a subjective health measurement with a global approach; it assesses overall health and thereby discriminates among people "throughout the full range of the health status continuum" (Ware Jr et al., 1981, p. 624). Because SRH does not only discriminate between severe (e.g., chronic) illness and good health, it is a highly suitable health measurement when studying general populations (Sullivan, 2003).

SRH is also sensitive to small health changes (Jylhä, Volpato, & Guralnik, 2006). Individuals are the first to notice differences in their own bodies, as people normally become aware of their health problems before they seek medical assistance or die. Changes in SRH should therefore precede more objective health indicators, including doctor visits or diagnoses. Compared with doctor visits or diagnoses, SRH should also be less affected by people's proneness to seeking medical assistance, which depends on several factors, including health insurance (Anderson, Dobkin, & Gross, 2012). This sensitivity gives a particular advantage in longitudinal investigations of health, as it captures more variability in health over time than do more objective indicators.

To ensure the validity of a given health measure, Ware Jr et al. (1981) recommended investigating whether the applied health outcome correlates with similar health outcomes. Empirical research into the relationship between SRH and more objective health measures tends to conclude that SRH is a valid health measure (DeSalvo, Bloser, Reynolds, He, & Muntner, 2006; Idler & Benyamini, 1997; Manor, Matthews, & Power, 2001). Longitudinal analyses suggest that SRH is strongly correlated with other self-reported measures (e.g., limiting longstanding illness), with psychological distress, and with physical conditions (e.g., obesity, respiratory symptoms, asthma, and backache) (Manor et al., 2001). Notably, the correlations are stronger with more serious conditions, such as epilepsy, cancer, and diabetes, than with less serious conditions, such as eczema and fever (Manor et al., 2001), suggesting that SRH is a better predictor of severe illness than of less severe temporary conditions. Several studies have concluded that SRH is a valid predictor of future health care usage (Van Doorslaer et al., 2000) and mortality (DeSalvo et al., 2006; Idler & Benyamini, 1997). A recent study also reports an SRH gradient in medical prescriptions, i.e., the worse the SRH, the higher the prevalence of medical prescriptions (Svane-Petersen & Dencker-Larsen, 2016), suggesting that people's judgements of their own health are in line with the judgements of medical doctors.

EU-SILC provides three self-reported health measures: SRH, longstanding illness, and limiting longstanding illness. Compared with SRH, longstanding illness involves a more concrete assessment of one's own health: "Do you have any long-standing illness or (long-standing) health problem? [By longstanding I mean illnesses or health problems that have lasted, or are expected to last, for six months or more]" (Robine et al., 2012). Limiting longstanding illness further investigates whether the concrete condition affects one's everyday life: "For at least the past six months, to what extent have you been limited in the activities

people usually do because of a health problem?" (Robine et al., 2012). An association between SRH and these variables could therefore provide some support for the validity of SRH as a health measure.

Table 1 shows simple longitudinal random models investigating statistical associations between SRH and the two other measures of health in EU-SILC, i.e., longstanding illness and limiting longstanding illness. This analysis splits the relationship between these variables into average over time (i.e., time invariant) and year-specific deviation from the mean, in what is often called the "hybrid method" (Allison, 2009, pp. 39-42) or the "between–within (BW) method" (Sjölander, Lichtenstein, Larsson, & Pawitan, 2013).

Table 1: SRH, random model specified according to the hybrid/BW method

Variables:	Model 1 SRH	Model 2 SRH
Longstanding illness, individual mean (mph020)	−1.496***	
	(0.003)	
Longstanding illness, yearly deviation from individual mean (dph020)	−0.473***	
	(0.002)	
Limiting longstanding illness, individual mean (mph030)		−1.669***
		(0.003)
Limiting longstanding illness, yearly deviation from individual mean (dph030)		−0.470***
		(0.002)
Number of observations	906,337	906,337
Number of respondents	365,068	365,068

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The results indicate:

- lower SRH scores among people with longstanding illness (Model 1)
- decreasing SRH scores when people contract longstanding illness (Model 1)
- lower SRH scores among people with limiting longstanding illness (Model 2)
- decreasing SRH scores when people contract limiting longstanding illness (Model 2)

These findings suggest that SRH is closely associated with longstanding illness and limiting longstanding illness. If the last two capture health in any way, one needs to acknowledge that SRH also does. Country-specific models reveal similar results: all coefficients are in the same direction and they are all statistically significant ($p < 0.01$, results not shown).

Most studies find a social gradient in SRH (for example Bobak, Pikhart, Hertzman, Rose, & Marmot, 1998; Borrell et al., 2009; Dahl & van der Wel, 2013; Ferrarini, Nelson, & Sjöberg,

2014; Kunst et al., 2005; Miething, 2013a, 2013b; Miething, Lundberg, & Geyer, 2013; Pförtner & Elgar, 2016; Reile et al., 2014) partly due to socio–economic differences in the assessment of health (Ware Jr et al., 1981). In the higher educated, poor SRH tends to be more strongly associated with physical limitations than in the lower educated (Delpierre et al., 2011; Delpierre et al., 2012). These findings indicate that higher-educated individuals are either more sensitive to their health or more adaptive to their health, for example, adjusting their assessments according to external information (e.g., from medical doctors). If members of some social groups are less sensitive to mental and physical changes in their own bodies, the negative health effects of external shocks (e.g., unemployment, declining income, or severe macroeconomic downturns) could be underestimated in these social groups.

Although SRH in general tends to be a good predictor of morbidity (Manor et al., 2001) and mortality (DeSalvo et al., 2006; Idler & Benyamini, 1997), some studies find that the association between SRH and these more objective health outcomes varies across countries (Bardage et al., 2005; Delpierre et al., 2011), indicating biases due to cultural factors (Jylhä, Guralnik, Ferrucci, Jokela, & Heikkinen, 1998). Regarding this issue, it is important to underscore that this thesis relies on analyses of *change* in individual SRH, not cross-sectional variation in *levels* of SRH. This is an important distinction. If a person in some way or another misinterprets her/his own health, and this person's interpretation of her/his own health is constant, one would expect the misinterpretation to remain constant. This means that a person who reports worse health than an objective assessment would suggest would keep reporting this level unless that person experiences *changes* in his or her condition. This analytical strategy removes bias due to constant personal or cultural differences in assessments. Nevertheless, the interpretation of one's own health may vary over time; for example, a person may be more satisfied with his/her own health when in a good mood. In that respect, people's "neutrality" regarding their own health could affect the estimates. However, unless this change is correlated with the explanatory variables, it would not affect the coefficients, only the standard errors. In other words, as long as the bias in interpretations of one's own health is random, i.e., the average bias is constant over time, it will not affect the estimates, only reduce the likelihood of significant results. This means that comparative longitudinal analyses are far less prone to bias due to cultural differences than are comparative cross-sectional studies.

SRH is a global health measure and therefore does not distinguish between forms of illness, most notably, between physical and mental illnesses. Though it would be preferable to make

this distinction, the EU-SILC data material does not provide appropriate items. Nevertheless, prescription medicine purchases within each SRH level (1–5, very good–very poor) are found to be very similar for somatic and mental pharmaceutical products (Svane-Petersen & Dencker-Larsen, 2016), suggesting that SRH is a global measure equivalently capturing mental and physical health.

4.2.2 Employment

The International Labour Organization (ILO) defines the unemployed as jobless people who want to work, are available to work, and are actively seeking employment (Bartley & Ferrie, 2001). In times of recession, when employment rates are low, many jobless people give up actively seeking employment. As they would define themselves as unemployed, despite not being included in the ILO definition, this thesis uses the self-defined status rather than the ILO definition.[6]

EU-SILC provides rich information on respondent activity status. At each interview, the respondents are asked to specify their main current activity status and main activity status in each month in the previous year. The activity status categories are: employee (full-time), employee (part-time), self-employed (full-time), self-employed (part-time), unemployed, permanently disabled or/and unfit to work, retired (or given up business), fulfilling domestic tasks and care responsibilities, student, other inactive, and compulsory military service. The monthly specification can be used to identify the exact time of transition, and hence estimate whether an outcome of interest is a function of the temporal distance from the transition. This thesis analyses the transition from employment (including self-employment) to unemployment, and does not consider other transitions, for example, the transition to disability, retirement, or other inactive categories.

4.2.3 Demographics and education

EU-SILC contains measures of demographic characteristics, including age, sex, marital status, degree of urbanization in the area where the respondent lives, and education level. Education level is measured according to the International Standard Classification of Education (ISCED), developed by UNESCO to provide comparable educational codes. Micro-level correlations between ISCED levels and scores in the international adult literacy survey in several European countries, i.e., Belgium (Flanders), Germany, Ireland, the Netherlands,

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[6] The EU-SILC data enable application of the ILO definition.

Sweden, and Great Britain, suggest that the ISCED instrument is a good proxy for skills (Steedman & McIntosh, 2001).

4.2.4 Income, material deprivation, and financial strain

Income and material deprivation are comprehensively covered by EU-SILC. Income, benefits, and taxes are reported at both the personal and household levels. Household expenses, such as rent and mortgage payments, are also measured. This information makes it possible to calculate the net disposable household income. All income instruments applied in this thesis are based on Eurostat calculations of equivalized disposable income, i.e., total household income, after tax and other deductions, divided by equalized adults.[7] Furthermore, the thesis investigates the impact of financial strain, i.e., self-perceived economic difficulties.

4.2.5 Harmonization of data

The EU-SILC data are harmonized according to the European Parliament and Council regulation 1177/2003 to make the measurements comparable across countries. This means that countries are required to measure certain concepts, although the wordings of the measurement items may not be consistent. SRH must be measured through a question about how a person perceives his/her health in general, and the answer categories have to be very good/good/fair/bad/very bad (Eurostat, 2016a). Nevertheless, the exact wording of this and other items used in the analyses can vary across countries. The regulation also allows for variation in survey methodology, including the interviewing method used; most countries use face-to-face interviews, but some use telephone interviews (Croezen, Burdorf, & van Lenthe, 2016).

In cross-sectional comparative studies, variations in sampling methods and item wordings are potential sources of bias, as differences in results between countries could be due to different item wordings (Jowell, 1998). However, in statistical models that control for the fixed effects of individuals using longitudinal data, wording variation would not affect the estimates unless the wording changes over time or if the wording differs in its sensitivity to capture effects of the investigated exposure (Allison, 2009; Kröger et al., 2015).

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[7] "Equalized adults" is the number of household members weighted according to their age and household structure, using the modified OECD equivalence scale.

4.2.6 Weights

The weights provided in the EU-SILC material are not always applicable in the longitudinal analyses conducted for this thesis, as they require time-invariant weights. To the extent that weights have been applied, for example, to adjust for disproportionate sample sizes across countries, these were generated through our own calculations (see Study III, p. 173 for a detailed description).

4.3 Welfare generosity and unemployment rates

The design, combination, and generosity of welfare policies vary across Europe, implying substantial variation in cash expenditures and social services, as well as in citizen rights to various welfare benefits and services (Francis G. Castles, 2009; Øverbye, 2015). Generally, three methodological approaches have been applied to address this variation: the spending, institutional, and regime approaches (Bergqvist et al., 2013; Dahl & van der Wel, 2013; Lundberg, Yngwe, Bergqvist, & Sjöberg, 2014, pp. 7-8).

4.3.1 Spending, institutional, and regime approaches

The spending approach uses aggregated data on public social spending as a measure of the generosity of welfare policies, which can function as a tool for investigating whether and to what extent various features of social protection policies affect health and health inequalities (Bergqvist et al., 2013; Lundberg et al., 2014, pp. 7-8). However, this approach has received extensive criticism. Measuring welfare spending assumes that the effects of welfare spending result from *how much* is spent, instead of from *how* the resources are used (Esping-Andersen, 1990, p. 8; Lundberg et al., 2014). Furthermore, the interrelationship between spending and problem size is often unaddressed. More recent papers address this issue by adjusting for need, i.e., percentages of GDP per capita divided by the percent of the population assumed to be in the target group (Dahl & van der Wel, 2013).

The institutional approach focuses on the institutional structure of the welfare state, emphasizing the importance of social insurance institutions and social citizenship for redistributive outcomes (Bergqvist et al., 2013; Dahl & van der Wel, 2013; W. Korpi & Palme, 1998). By using historical data on welfare programme characteristics, the institutional approach addresses the impact of social policy design. One major challenge of this approach is choosing what traits to use, for example, levels, conditions, durations, and coverage, and

how to weight these against each other (Dahl & van der Wel, 2013). Furthermore, including all relevant institutional factors in statistical analyses implies a major risk of overfitting the model.

The regime approach has been used in several empirical studies of health and health inequalities (e.g. Bambra & Eikemo, 2009; Bambra, Netuveli, & Eikemo, 2010b; Eikemo, Bambra, Joyce, & Dahl, 2008a; Eikemo, Bambra, Judge, & Ringdal, 2008b; Eikemo et al., 2008c; Karim, Eikemo, & Bambra, 2010; Norström & Grönqvist, 2014; Richter et al., 2012). This approach entails clustering welfare states into groups with different institutional characteristics (see, e.g., Esping-Andersen (1990), Francis G Castles and Mitchell (1992) and Hall and Soskice (2001)). An advantage of the regime approach is that it provides a framework for assessing the impact of social structures and welfare institutions (Dahl & van der Wel, 2013). Nevertheless, the most prominent regime developer, Esping-Andersen (1990), never intended to use these regimes for studying health-related outcomes, and the applicability of the approach for such purposes is debatable, as clusters are crude and consequently blur within-regime differences (Lundberg et al., 2008).

This thesis investigates the impact of generous welfare services, applying the spending approach following Dahl and van der Wel (2013) and Saltkjel et al. (2013). Data on institutional aspects and social policy arrangements are available from the Social Citizenship Indicator Program and the Comparative Welfare Entitlements Dataset. However, it is difficult to compare institutional characteristics between countries because of structural and qualitative variation in the institutional arrangements. To avoid this problem, Article V uses family income (i.e., equivalized disposable income). Although income in families in which at least one person is unemployed measures the generosity of welfare policies indirectly (as the sum of income, transfers, and tax reductions), it more precisely estimates actual disposable income among the unemployed than do measurements of institutional characteristics.

4.4 Analytical strategy

Following the call made in systematic reviews and meta studies (see e.g. Frasquilho et al., 2016; Gunasekara et al., 2011; Kröger et al., 2015; McKee-Ryan et al., 2005), all empirical studies included in this thesis apply longitudinal data and methods. While cross-sectional analyses of SRH are normally biased due to the unobserved characteristics of individuals (Allison, 2009), longitudinal data and models inherently control for constant characteristics by

investigating *trends* in SRH instead of *levels*. However, panel data are not a "magic bullet" in themselves (Morgan & Winship, 2007, p. 274), and investigating causal relationships still requires appropriate methodological design.

4.4.1 Panel data analysis

Longitudinal analyses of panel data usually apply *random effects* or *fixed effects* to the units (e.g., individuals). Random-effects models use both within- and between-individual variation. Such models assume that the independent variable is random, i.e., that the individual-specific effects are uncorrelated with the independent variables. If this condition is not met, the estimates will be driven toward cross-sectional differences (Hausman & Taylor, 1981). Fixed-effects models use only the within-individual variation, eliminating biases due to cross-sectional differences (Allison, 2009). In cases in which the independent variable is found to be non random, the fixed-effects estimates will provide more consistent estimates but at the expense of efficiency (i.e., less variance, and hence less statistical power).

The average health change in a population should remain constant over time. That means that unless the population is exposed to something that affects its health, there is no reason to expect larger health changes in one period than another. By assuming that exposures to the Great Recession and to welfare policy generosity are random, i.e., not correlated with other factors that affect national health trends, it is possible to apply random models. This is of course an empirical question and a debatable assumption. However, no theories of underlying explanations have been suggested. The impact of generous welfare policies on health is therefore investigated using random models (the basic equation underlying mixed-effects ordinal logistic regression models is presented and explained in Study II, p. 3).

Whether one is exposed to unemployment depends on several individual factors, some of which are unobservable (e.g., motivation and abilities). Studies of the individual health effects of unemployment (studies III–V) therefore apply fixed-effects models. The basic linear regression model is:

$$y_{it} = \boldsymbol{\beta}\mathbf{x}_{it} + \alpha_i + \varepsilon_{it}, \qquad t = 1, \ldots, T(i), i = i, \ldots, N,$$

where y_{it} is the outcome at time t for individual i, x is an explanatory variable, β is the estimated coefficient, α_i is a vector of cross-sectional time-invariant heterogeneity, and ε is the error term. The main advantage of the fixed-effects model is that it filters out all time-invariant individual factors (α_i), implying that the estimated correlations between the outcome

and explanatory variables are not biased due to constant characteristics such as ethnicity, culture, and gender (Gunasekara et al., 2014).

Although the model controls for time-invariant characteristics, it is still possible to investigate cross-sectional differences in correlations between exposure and outcome. By including an interaction term, it is possible to investigate the extent to which the correlation between change in health and life events (e.g., unemployment) varies between social groups. This strategy is applied to investigate the divergence in the health effects of unemployment between genders, educational levels, and age groups, as well as to generate country-specific estimates (Study III). The country-specific estimates are used for comparative analysis (Study IV).

The fixed-effects model assumes strictly exogenous regressors, which means that previous outcomes cannot affect current covariates (Gunasekara et al., 2014). In studies II–V, SRH at $t-1$ cannot affect future covariates (e.g., marital dissolution) that also affect health. Time-variant individual characteristics, also labelled time-variant confounders, could affect both the outcome and the explanatory variables. For example, alcoholism or marital dissolution could lead to both unemployment and poor health, with unemployment mediating the effect of marital dissolution on health. Some authors have suggested using dynamic models as a solution to this problem (Ahn & Schmidt, 1995; Steele et al., 2013).

4.4.2 Micro–macro analyses

The idea underlying micro–macro-level analyses is to analyse variation in the country-specific estimates derived from panel models. The simplest and most intuitive method is the two-step approach (exemplified by Hussain, Kangas, & Kvist, 2012), in which individual-level data are used to obtain country-specific estimates, which are in turn used as outcomes in regressions using macro-level explanatory variables. Study IV applies an integrated alternative to this model: an individual fixed-effects model with macro-level interactions. This thesis accordingly shows the advantages of using longitudinal data and statistical models for comparing countries. While differences in health levels could be due to unobserved cross-national variation, such as cultural differences in health assessment, changes in health over time are less affected by such cross-national variation as long as this variation is stable over time.

All empirical analyses in studies II–V were conducted in Stata, versions 13 and 14.

5   Ethical considerations

Access to the main data source, EU-SILC micro data, is provided by Eurostat (reference number 58/2013-EU-SILC) for scientific purposes only. To apply for access, the project group first had to have Oslo and Akershus University College of Applied Sciences (HiOA) recognized by Eurostat as a research entity (i.e., a university, research institution, or research department). Once Eurostat recognized HiOA as a research entity, we applied for access by submitting a joint research proposal. Final approval was granted on 4 February 2014. Eurostat provides detailed information on the application process on its website (see European Commission, 2015 for a detailed description).

EU-SILC micro data operate under a framework Regulation of the Council and the Parliament (EC No. 1177/2003) and a series of Commission implementing regulations. The micro data do not contain any sensitive information such as names or addresses that would allow direct identification of respondents.

Eurostat sent all micro-level data files, encrypted and stored on CDs, by registered mail to the project leader, Professor Espen Dahl. The data were stored in a locked part of an internal server at HiOA. Only project members have access to this part of the server.

All macro data used come from publicly available sources. In cases in which these data are aggregated from micro data, it is assumed that these data have been collected and aggregated in agreement with ethical guidelines adopted by the involved governments as well as by the international research community.

When using previously collected quantitative data, there are still ethical considerations beyond data collection and storage. Researchers usually have little or no control over how their results are eventually used, but they do have responsibility for how they present and interpret their results. In this thesis, this responsibility concerns the representation of disadvantaged groups, ways of writing about unemployment and health, and the use of stigmatizing concepts such as "high" and "low" social class. Throughout this thesis, I have endeavoured to avoid stigmatizing disadvantaged groups in presenting and interpreting the results.

6 Brief summary of each article

Study I

Dahl, E., Tøge, A. G., Heggebø, K., Elstad, J. I., Berg, J. E., & Halvorsen, K. (2015). Er økonomisk krise ensbetydende med helsekrise – hva forteller forskningen? [Is economic crisis equivalent to health crisis – what does the research say?] *Tidsskrift for velferdsforskning*, 18(2), 62–73.

The Great Recession is the worst economic crisis to hit the Western world since the Great Depression in 1930. Various actors, including the OECD, are concerned about the social consequences of the recession, and about how these consequences could affect population health and health inequality. Intuitively, one would assume that economic crises are detrimental to public health; however, historically research into the health effects of economic downturns does not provide unequivocal findings. Applying a scoping approach, this article reviews 45 empirical studies of how and to what extent the Great Recession has affected public health in European countries, and whether specific social groups have been disproportionately affected.

The reviewed studies jointly arrive at five main findings. First, out of 52 findings (from 45 studies), 30 indicate negative, eight positive, and 14 no health effects of the Great Recession. Second, only 17 studies investigate the impact of the Great Recession on health inequalities, 13 of which indicate increased and four indicate decreased health inequalities. Third, the included studies vary in research design, statistical method, and measured health outcome. This variation can be considered a strength, though it also constitutes a weakness, as it makes it difficult to compare results across studies. Fourth, studies from some countries (e.g., United Kingdom, Greece, Italy, and Spain) are overrepresented, while studies from other countries (e.g., Portugal) are lacking. Firm conclusions on how the Great Recession has hit European countries in general can therefore not be drawn. Fifth, comparative studies investigate only effects on mortality. Given the underlying decreasing trend in mortality, further comparative research would benefit from investigating other health outcomes.

Overall, the review suggests that future research should apply research designs that are more robust to omitted variable bias, explore the impact on health inequalities in more detail, and test more theoretically grounded hypotheses as to the mechanisms explaining the impact of the Great Recession and unemployment on health.

Study II

The impact of the Great Recession on health, particularly in vulnerable groups, is a global concern. During the Great Recession, restricted economic resources could limit people's abilities to cope both with their own situations and with interpersonal relationships, which could in turn affect their health. Generous welfare policies are assumed to buffer against such negative effects, by providing people access to economic resources they would otherwise lack. Given the social consequences of the Great Recession, one would expect the generosity of welfare policies to be particularly important in this period. However, research provides little insight into changing health inequalities and the possible buffering effects of welfare policies. This study analyses changes in SRH before and during the Great Recession, and investigates whether these changes vary between social groups and across levels of generosity of unemployment benefits and services.

The study used data from two EU-SILC panels: 2005–2007 constitutes the pre-recession period and 2008–2011 the Great Recession period, which was separated into mild and severe recessionary periods. Both panels were restricted to the working-age population (25–60 years old) from the 23 European countries that participated in both periods. Mixed-effects ordinal logistic regression models were applied to estimate the effects of socio–economic status (SES) and generosity of unemployment benefits and services on fair and poor SRH, during pre-, mild, and severe recessionary periods.

The results indicate that SES and the generosity of unemployment benefits and services are associated with SRH trends across pre-, mild, and severe recessionary periods. However, none of the factors appears to be more important in the countries hardest hit by the Great Recession (2008–2011) than in the pre-recession period.

Overall, this study does not find changing health inequalities during the Great Recession, compared with the pre-recession period. Furthermore, it finds that the generosity of unemployment benefits and services has had a similar effect on SRH during the Great Recession (2008–2011) as it did in the years before.

Study III

Tøge, A. G., & Blekesaune, M. (2015). Unemployment transitions and self-rated health in Europe: A longitudinal analysis of EU-SILC from 2008 to 2011. *Social Science & Medicine*, 143, 171–178. doi: 10.1016/j.socscimed.2015.08.040

Following the Great Recession, unemployment rates in the European Union (EU-28) rose from 6.8 per cent in January 2008 to 10.0 per cent in January 2012, thereby revitalizing consideration of the causal health effects of unemployment. This study estimates the average change in SRH associated with transitions from employment to unemployment.

The study uses the 2008–2011 longitudinal panel of EU-SILC (28 countries). The dependent variable is SRH (continuous scale). Unemployment, re-employment, and time-splines (i.e., the temporal distances between the times of the unemployment transition and the times of the interviews) are used as explanatory variables. Fixed-effects models are used to estimate whether the health of individual i at time t is a function of becoming unemployed and of unemployment duration, controlling for re-employment. All fixed-effects models control for time-variant factors, such as marital status, cohabitation, and dependent children. Ordinary least squares (OLS) models are used to estimate cross-sectional differences in SRH between the employed and unemployed.

The results indicate that unemployed individuals report –0.287 poorer SRH than do employed individuals. This correlation between unemployment and health is partly due to a decrease in SRH as people enter unemployment. Such health changes vary by the country of domicile and by individual age, older workers experiencing a steeper decline than do younger workers, but no significant educational or gender differences were found.

The mean health drop in SRH as unemployment begins is –0.039, but the analysis suggests that most people of all ages tend to regain their pre-unemployment health within about two years.

Health is generally poorer among the unemployed than the employed (–0.287), though only a minor part (–0.039) of this difference is driven by immediate health changes when people become unemployed. This suggests that both the causal effect of unemployment and health selection of individuals in poor health into unemployment are mechanisms explaining poorer health among the unemployed than the employed; however, during the Great Recession health selection has been the stronger of the two mechanisms.

Study IV

Tøge, A. G. (2016b). Health effects of unemployment in Europe during the Great Recession: The impact of unemployment generosity. *International Journal of Health Services*, 46(4), 614–641. doi: 10.1177/0020731416664688

Due to rising unemployment rates, the possible health effects of unemployment have attracted increased interest over the last few years. Empirical findings indicate between-country variation in the health effects of individual unemployment transitions, suggesting that the health effects of unemployment could depend on contextual circumstances, including the generosity of unemployment benefits and services. This article investigates whether the generosity of unemployment benefits and services explains why the individual health effects of unemployment vary across Europe.

The study uses the 2008–2011 longitudinal panel of EU-SILC. The dependent variable is SRH (continuous scale) and the main explanatory variables at the individual level are unemployment transition and unemployment duration. Adjusted social spending on unemployment, i.e., social spending per capita divided by the number of non-employed, is used as a proxy for the generosity of unemployment benefits and services. Fixed-effects models are used to estimate the individual effects of unemployment on SRH. Interactions between generosity, on one hand, and unemployment transition and unemployment duration, on the other, are used to investigate whether the health effects of unemployment vary according to the generosity of unemployment benefits and services.

The results indicate that welfare generosity is associated with reduced negative effects of unemployment on SRH. For every one unit (log) increase in adjusted spending, the negative effect of unemployment on SRH is reduced by 0.003 (SE = 0.001). Furthermore, the change in SRH is improved by 0.002 (SE = 0.001) for each year following the transition. Because the health effects of unemployment are smaller in countries with more generous unemployment benefits and services, the results indicate that such policies mitigate the negative health effects of unemployment.

Study V

Tøge, A. G. (2016a). Health effects of unemployment in Europe (2008–2011): A longitudinal analysis of income and financial strain as mediating factors. *International Journal for Equity in Health*, 15(1), 1–12. doi: 10.1186/s12939-016-0360-6

Unemployment has a number of negative consequences, such as decreased income and deteriorating health. However, the relationships between unemployment, income, and health are not fully understood. Longitudinal studies have investigated the health effects of unemployment and income separately, but the mediating role of income remains to be scrutinized. Using longitudinal data and methods, this study investigates whether the effect of unemployment on SRH is mediated by income, financial strain, and unemployment benefits.

The study uses the longitudinal panel of EU-SILC (2008–2011). The dependent variable is SRH (continuous scale). The main explanatory variables are unemployment transition, financial strain, and income. Income is the net sum of disposable household income, including welfare benefits and minus fixed costs, and adjusted for inflation and household size. Four different codings of income are applied to capture absolute income, relative income, relative income rank, and income deprivation (i.e., less than 60 % of national median household income). The study use individual fixed-effects models to estimate the change in SRH as people move from employment to unemployment, and whether this change is reduced after controlling for absolute income change, relative income change, relative income rank, income deprivation, financial strain, and unemployment benefits.

Transitions into unemployment are associated with decreased SRH (−0.048, SE 0.012). This decrease is 19 per cent weaker (−0.039, SE 0.012) after controlling for change in financial strain. Absolute income change, relative income change, change in relative income rank, becoming income deprived, and changes in unemployment benefits are not found to be associated with change in SRH and do not reduce the effect of unemployment on SRH.

Consequently, the results indicate that financial strain mediates the individual health effects of unemployment, while neither income (i.e., absolute, relative, rank, or deprivation) nor unemployment benefits do. The discrepancy between these results may indicate that the health effects of unemployment are driven by self-perceived economic stress, including perceived future economic prospects, which is not necessarily captured by objective measures of income change.

7 Discussion

The Great Recession generated severe economic effects, including higher unemployment (Ruhm, 2015; Suhrcke & Stuckler, 2012). The empirical research on possible consequences for health and well-being display great diversity, varying by sample, design, statistical method, and health outcome, making it difficult to compare their results and draw strong conclusions. Furthermore, some studies investigate the individual health effects of one's own job loss (e.g. Böckerman & Ilmakunnas, 2009; Huijts et al., 2015; J. K. Morris, Cook, & Shaper, 1994; Moser, Fox, & Jones, 1984; Schmitz, 2011), while others investigate the public health effects of fluctuations in unemployment rates (e.g. Gerdtham & Ruhm, 2006; Neumayer, 2004; Ruhm, 2000, 2003, 2005, 2012, 2015). This thesis investigates both public health effects of the Great Recession (Study I) and individual health effects of becoming unemployed (studies III–V). To buffer the potential negative health effects of the Great Recession and of individual unemployment, generous welfare policies are of particular importance (Karanikolos et al., 2013; Stuckler & Basu, 2013; Stuckler et al., 2010a; Stuckler et al., 2010b; Stuckler et al., 2009a; Suhrcke & Stuckler, 2012). This thesis tests whether generous unemployment benefits and services have been more important for public health during the Great Recession than during the pre-recession period (Study II), as well as whether welfare generosity and household income explain the individual health effects of unemployment (studies IV and V).

7.1 Summary

This thesis explores the potential effects of the Great Recession and individual unemployment on SRH. The literature review (Study I), based on 46 studies, suggests that the Great Recession had negative effects on health and health inequalities. The four succeeding studies (II–V) are empirical and use the longitudinal panel of the EU Statistics on Income and Living Conditions (EU-SILC). These studies investigate the public health effect of the generosity of unemployment benefits and services (Study II), the individual health effects of unemployment (studies III–V), as well as whether such individual effects can be explained by household financial conditions (Study IV) and generous unemployment benefits and services (Study V). In summary, these studies demonstrate that generous unemployment benefits and services affect both population health (Study II) and the individual health effects of unemployment

53

(Study IV). However, the household financial situation performs poorly as an explanation of the individual health effects of unemployment (Study V), suggesting that the generosity of unemployment benefits and services has an effect on health that goes beyond the direct effect on income. A more detailed description of each study's aim, outcome, methods, and results can be found in Appendix 3.

7.2 Discussion of main findings

Economic declines, sovereign debt crises, and recessions have social consequences in terms of unemployment, financial insecurity, and poverty. Do they also affect health and health inequalities (as illustrated by arrow A in Figure 2, p. 11)? Drawing on the results of the literature review, this thesis suggests that the Great Recession was associated with deteriorating population health. However, due to the plurality of methods, sampled populations, health outcomes, and socio–economic stratification variables, it is impossible to compare effect sizes across the studies included in Study I. The plurality of methods is also the reason why Frasquilho et al. (2016) conducted only a systematic review, not a meta-analysis. Standardized coefficients, which would have made studies more comparable, are unfortunately also rare (Kröger et al., 2015).

Did the Great Recession generate increasing health inequalities? Of the studies reviewed in Study I, most indicated that vulnerable populations were at disproportionate risk. Study I thereby confirms results of the review by Frasquilho et al. (2016), indicating that different social groups have been affected differently. Frasquilho et al. (2016) found that the Great Recession particularly harmed health among those who were particularly exposed to its consequences, i.e., people who were unemployed, heavily indebted, or experiencing financial strain. Regarding the unemployed, this pattern is confirmed by the results of Study I (a link to a table of the reviewed studies is provided in Appendix 1).

Nevertheless, some of the studies reviewed in Study I suggest decreasing inequalities or no change. Such mixed results could be due to several factors, including differences in health outcome measures, socio–economic indicators, statistical methods, and populations analysed (Gunasekara et al., 2011; Kröger et al., 2015).

A prominent hypothesis is that generous welfare policies compensate for a lack of individual resources, thereby reducing the negative health effects of recessions (as illustrated by arrow B in Figure 2, p. 11), particularly in the most vulnerable populations (Marmot et al., 2013).

Study II brings together the micro and macro levels by investigating whether generous unemployment benefits and services affect health, and whether this effect depends on how hard the countries were hit by the Great Recession. In line with Stuckler et al. (2010a), the results suggest that generous unemployment benefits and services have positive health effects. One unit (log) more social expenditure per person in need is associated with a 0.082-unit decreased risk of fair health and a 0.045-unit decreased risk of poor health in the countries that experienced the most dramatic increase in unemployment rates. This means that the difference between living in the Nordic countries versus Eastern Europe is more or less equivalent to the difference between being young (25–40 years old) and being middle aged (41–60 years old) (results not shown). If this health inequality is caused by the generosity of the welfare policies, becoming unemployed in a country with generous welfare policies could substantially decrease the risk of poor health. Nevertheless, one should be careful with causal interpretation. The relationship could be spurious: underlying factors could cause both generous welfare policies and resilience towards the negative health effects of recessions. Furthermore, the health effects of generous unemployment benefits and services are no stronger in the countries hard hit than in those less severely hit (or in the pre-recession period). As such, these results do not provide evidence that generous unemployment benefits and services are particularly important for public health in times of recession. Rather, the results suggest that welfare generosity is important independently of economic climate.[8]

Did individual unemployment transitions cause deteriorating health (as illustrated by arrow C in Figure 2, p. 11)? The results of studies II, IV, and V suggest that the answer is yes. However, Huijts et al. (2015) found the effect of unemployment on SRH to be 0.12, which is much stronger than the effects found here. The strong health effect in Huijts et al. (2015) is mainly due to the application of a cross-sectional model with baseline controls. While fixed-effects models control for all differences, both observed and unobserved, between respondents, cross-sectional models can only control for a selection of observed baseline differences (Allison, 2009). This means that the large effect in Huijts et al. (2015) is probably partly due to omitted variable bias, i.e., lack of control for factors affecting both unemployment and SRH. According to Salm (2009), the change in SRH associated with

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[8] Although generous welfare policies could affect health among the unemployed, "welfare sceptics" argue that generous welfare states contribute to low work morale and that generous welfare policies therefore pose a serious threat to the welfare state. This is a contested topic, and van der Wel and Halvorsen (2015) found that both the overall generosity of welfare policies as well as ALMPs are associated with higher employment commitment, even among the unemployed. However, the causal direction is still debatable. It could be due to reversed causation (i.e., the specific norms enable generous welfare policies, rather than the other way around) or due to a random correlation between generous welfare policies and the true cause.

layoffs tends to be smaller (–0.018) than the change associated with quitting (–0.098). Studies III–V do not distinguish between layoffs and quitting, but the estimated effects are closer to what Salm (2009) finds for the former than the latter. Furthermore, this thesis demonstrates that the health effects are much stronger among older than younger workers. In fact, the health effects on young workers are close to zero. This finding fits well with previous research on the mental health effects of unemployment, suggesting that older workers are more vulnerable to the health effects of unemployment than are younger workers (Goldman-Mellor et al., 2010).

Because respondents are followed over time and report detailed information on monthly employment status, it is possible to investigate and control for reverse causation, i.e., health deterioration in the years before becoming unemployed. None of the analyses suggests reverse causation.[9] However, after the respondents become unemployed, the average trend in SRH is positive and SRH returns to the initial pre-unemployment level after about two years (Study III). This trend holds when controlling for re-employment, suggesting that either health improves in the years after unemployment begins or some form of psychological adaptation occurs, i.e., that people adjust their expectations to their new situation. The first interpretation would imply that long-term unemployment does not cause negative health effects. Although some studies might find health selection into long-term unemployment (Kokko, Pulkkinen, & Puustinen, 2000), many demonstrate that long-term unemployment causes health to deteriorate (McKee-Ryan et al., 2005; Milner, Page, & LaMontagne, 2013), suggesting that the adaptation mechanism is the most plausible explanation of increasing SRH in the years after becoming unemployed.

Returning to the negative development in SRH experienced as people become unemployed, this thesis notes substantial variation in the health effects of unemployment. This variation is used to investigate possible mechanisms of these health effects. A prominent hypothesis is that unemployment affects health through its effect on income, and that unemployment benefits thereby reduce the health effects of unemployment (as illustrated by arrow E in Figure 2, p. 11). The results of Study IV indicate that the more generous the unemployment benefits and services at the national level, the less detrimental the effects of unemployment, suggesting that generous welfare policies have a buffering effect. These results remain significant even after controlling for increasing unemployment rates (as illustrated by arrow D

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[9] If anything, this thesis suggests that people who become unemployed experience favourable health development in the years before they become unemployed (see Study III).

in Figure 2, p. 11), indicating that this is a mechanism that operates independently of identified compositional change (Heggebø & Dahl, 2015).

When investigating the possible mediating effect of income and financial strain at the household level, only financial strain is a possible mediator of the effect of unemployment on SRH. Inspired by Kawachi, Adler, and Dow (2010) and Miething (2014), Study V investigates several mechanisms, including absolute income, income deprivation, relative income, relative rank, and self-perceived economic stress. Furthermore, it distinguishes between market income and benefits, as their effects could differ from each other (Huijts et al., 2015). Overall, Study V does not find any of the income-related mechanisms in operation, though financial strain could mediate up to 20 per cent of the effect of unemployment on SRH. These results suggest that perceived economic uncertainty and stress (see, e.g., Dencker-Larsen et al. (2016); Farmer and Ferraro (1997); Strandh (2000)) could be mechanisms explaining the health effects of unemployment.[10] Nevertheless, one must be careful when interpreting, as both financial strain and SRH are self-reported measurements. This means that underlying time-varying factors (e.g., mood) could affect both respondents' perceptions of their own health and their beliefs regarding the financial conditions of the household. Furthermore, household income could be affected by economic coping strategies, for example, whether a spouse takes on more work to compensate for a partner's reduced income.

The redistributive nature of generous welfare benefits is assumed to mitigate detrimental health outcomes in vulnerable populations by reducing the negative health effects of low income and financial strain (Frasquilho et al., 2016; Lundberg, Fritzell, Åberg Yngwe, & Kölegård, 2010; Marmot et al., 2013). However, assuming that the redistribution of income from the employed to the unemployed reduces the negative health effects of unemployment is a specious interpretation of Study IV, as none of the investigated income mechanisms in Study V was found to have mediating effects. These seemingly contradictory findings are puzzling: generous welfare policies mitigate the health effects of unemployment (Study IV), but the health effects of unemployment are not mediated by reduced household income (Study V). Identifying the causal pathways is therefore challenging. One possible explanation could be that the mediating effects of generous unemployment benefits and services are generated through mechanisms other than their effect on income.

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[10] It must be emphasized that these are short-term effects; income-related mechanisms could be more important in explaining long-term effects.

Several alternative explanations are possible. First, the awareness of generous welfare policies could constitute a form of psychological relief that reduces unemployment-related stress. Another possible explanation is that the negative health effects of unemployment stem from the stigma people can experience when claiming benefits (Baumberg, 2016). Generous unemployment benefits and services could reduce this stigma by covering the entire population (Rothstein, 1998). If generous services also imply higher-quality services, this could further reduce the stigma (Ohls, 2016). A third explanation could be that the mitigating effect is driven by generous services rather than generous unemployment benefits. At the macro level, several studies have indicated that ALMPs reduce the negative effects of economic downturns on mental health and suicide (Reeves et al., 2015; Stuckler et al., 2009a; Uutela, 2010). At the individual level, this mechanism is supported by Dencker-Larsen et al. (2016), who found that the effect of unemployment transition on cortisol levels is less severe among persons participating in ALMPs, suggesting that they alleviate psychological distress. Fourth, the health effects could depend on institutional design. If countries with generous unemployment benefits and services provide longer insurance periods, this could have an effect on stress, affecting health beyond the direct effect on material resources here and now. Given the same monthly benefit amount is paid to two different people, one with 50 weeks of eligibility and one with 12 weeks, unemployment could be experienced as more stressful by the person with 12 weeks of benefits, even though their monthly income and benefits are exactly the same.

Following the ideas on causality and mechanisms outlined in chapter 2.4 (pp. 18–19), all of the mechanisms suggested above provide plausible causal stories (Elster, 2007). However, causal chains supporting these mechanisms are not observed in the data. Consequently, none of them can be proved, so they constitute speculations as to what mechanisms could be in play (Elster, 2007). Moreover, the analyses cannot reject a spurious relationship, i.e., that the true cause correlates with the generosity measure. Countries providing generous unemployment benefits and services could have other characteristics that promote health among the unemployed, such as more universal than means-tested welfare policies, which are suggested to facilitate trust and self-respect (Rothstein & Stolle, 2003), which again could affect health when people become unemployed.

Studies III–V investigate the health effect of the individual unemployment transition. Although these three studies use the same data and estimators (i.e., fixed effects), the estimated health effects of unemployment differ between them. This is mainly because Study

V is restricted to a subsample of the panel, while studies III and IV use the entire panel. This affects the counterfactual situation. Studies III and IV investigate the health change in people who become unemployed relative to the health change in all those that do not, including all the stable employed and unemployed. The counterfactual reference of comparison in these two studies is *not having a transition*. Study V uses only information from people who actually became unemployed in the observational period, and therefore compares the health change in years of unemployment transition with the health change in years without unemployment transition. This means that the counterfactual in study V is *not having a transition now, but having one within the observational period*. Because the underlying health trend in the general population is more negative than the underlying health trend among those who experience unemployment transitions, the detected health effects are stronger in Study V than in Study III.[11]

The results of Study III indicate that the effects of the Great Recession on population health are partly due to the health effects of unemployment (Study III). Exactly how much could the individual health effects contribute to the effects on population health? The investigations of how individual SRH changes as people move from employment to unemployment suggest that SRH is reduced by somewhere between 0.035 and 0.050 for people who entered unemployment between 2008 and 2011 (studies III–V). In this period, the unemployment rate in Europe increased from 6.8 to 9.5 per cent, i.e., 2.7 percentage points (see Figure 1, p. 8). If the Great Recession had no impact on the health of the employed, and if individual unemployment transitions reduce SRH by 0.050, a 2.7 percentage point increase in the unemployment rate would imply a 0.00135 decrease in SRH at the population level. If the Great Recession generated effects on SRH beyond the effects of individual unemployment on health, estimates should be larger than 0.00135. Due to the lack of studies investigating the overall causal effect of the Great Recession on SRH in Europe, it is impossible to determine whether the Great Recession had a health effect beyond the effects generated by individual unemployment.

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[11] Despite using the same sample, studies III and IV still produce somewhat different effect sizes. While Model 3 in Study III indicates a health effect of −0.035, Model 2 in Study IV indicates an effect of −0.050. This is due to a somewhat different coding of unemployment transition and re-employment. While Study IV uses the lagged command ("l.") in Stata to identify whether an observation is after a transition, Study III uses a more mechanistic identification ("[t – 1]"). The lagged command ("l.") treats a previous valid observation as a previous observation, while the mechanistic identification ("[t – 1]") treats any previous observation, even a missing one, as a previous observation. This means that those respondents with missing information on SRH in the year before they became unemployed tended to experience somewhat larger health effects of unemployment.

7.2.1 Health selection

Indirectly, by applying both cross-sectional and longitudinal models, Study III also investigates the relative importance of causal health effects and health selection effects in explaining the health inequalities between the employed and unemployed. In contrast to the results of a systematic review, narrative synthesis, and meta-analysis of empirical studies (Kröger et al., 2015) suggesting that selection and causal mechanisms are equally supported, Study III demonstrates that the health selection effects are stronger, although causal health effects are also present. In this regard, it is important to emphasize that studies of high quality, using better methods and designed to permit causal inference, generally tend to provide stronger support for health selection than for causal health effects (Kröger et al., 2015).

7.3 Limitations

Spending on unemployment benefits and services is a crude measure of generous welfare policies. Even when adjusted for need, spending data provide no information on whether people in need actually receive the benefits and services, as these figures do not report how the money is spent. This means that spending will be a poor proxy of welfare generosity in cases in which there is little or no association between adjusted spending and actual welfare policy performance. However, these factors are likely to be correlated. van der Wel and Halvorsen (2015) found that countries with high overall social expenditures (including spending on unemployment, housing, social exclusion, sickness and disability, and family and children) were more generous when it comes to ALMPs, which might be a better proxy of the actual performance of the welfare policies. ALMPs are found to reduce the short-time effects of economic downturns on suicides (Stuckler et al., 2009a) and mitigate the negative health effects of individual unemployment transitions (Dencker-Larsen et al., 2016).

"The major health-related and societal problems that a deep economic crisis may trigger are unlikely to materialise immediately" (OECD, 2014, p. 30). At the individual level, the health effects of unemployment often take time to manifest themselves in health outcomes (McKee-Ryan et al., 2005), implying that the effects would depend on the duration of the unemployment spell. This hypothesis is supported by systematic reviews and meta-analyses that find a higher risk of suicide (Milner et al., 2013), lower levels of SRH, poorer mental health, and less life satisfaction (McKee-Ryan et al., 2005) in the long-term unemployed. Study III investigates whether SRH changes in the years after the unemployment spell,

finding an increasing trend, i.e., improved health, a result that holds even after controlling for re-employment. Nevertheless, the respondents are followed for a maximum of four years, implying that we can observe a maximum of three years of unemployment after an unemployment transition. If the negative long-term effects of unemployment start only after more than three years, they are not captured by the present analyses.[12]

At the societal level, it usually takes time before an economic downturn manifests itself in policy changes, including various austerity policies (Lahelma et al., 2002; OECD, 2014; Stuckler & Basu, 2013). Buffering policies in place before a recession occurs will therefore remain effective at least through the early stages of the recession. Such mechanisms could have reduced the immediate health effects of the Great Recession as well as the health effects of individual unemployment in this period. If disadvantaged populations are particularly vulnerable to austerity policies, this will first manifest itself in increasing health inequalities several years after the Great Recession.

Fixed-effects analysis solely uses within-individual variation, for example, how people's health changes as other factors (e.g., employment status) change, as the model itself controls for fixed factors (Allison, 2009; Gunasekara et al., 2014). Several characteristics, such as gender or country of birth, are easily determined as fixed effects. Nevertheless, difficulties arise when determining whether or not the "manner of decision making" is time variant. If it is not time invariant, it will not affect the estimates. However, if the "manner of decision making" changes during the four-year observational window, for example, affected by shifting mood, it could represent an unmeasured time-variant confounder.

Levels at baseline are important for potential change. Change from one time to another depends on the level at the first observation, particularly if this is a scale. A score at the upper end of the SRH scale implies that there is more latitude for downwards than upwards change, which means a higher probability of negative than positive change (Böckerman & Ilmakunnas, 2009).

Another important factor is attrition. If people who are more prone to the negative health effects of the Great Recession and individual unemployment tend to drop out of the panel, the effects examined in studies II–V will be underestimated. On the other hand, (McKee-Ryan et

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[12] Long-term effects could also apply to people other than the ones directly exposed (OECD, 2014). To the extent that unemployment and income reduction lead to poverty, children could be more prone to health effects than adults (Starfield, 1992), as family conditions are an important factor affecting children's health development (Frasquilho et al., 2016).

al., 2005) have argued for the opposite relationship: that attrition is *less* widespread among the respondents who are most prone to unemployment. For these respondents, staying in the panel could be a way to communicate their unemployment experience.

The studies constituting this thesis are concerned with the health effects of the Great Recession and of individual unemployment transitions. However, perceived job and economic insecurity, for example, through flexible work arrangements, could pose a similar, or even stronger, threat to health. A systematic review and meta-analysis of studies examining the impact of perceived job insecurity and unemployment on depressive symptoms found that job insecurity was modestly more strongly associated with depressive symptoms than was unemployment, suggesting that job insecurity is at least as harmful to health as is unemployment (Kim & von dem Knesebeck, 2016). Nevertheless, it is worth noting that few (i.e., six) studies investigated the impact of job insecurity, compared with the relatively plentiful (i.e., 14) studies of the effects of unemployment. The results were also heterogeneous. Knowing that the prevalence of job insecurity varies across Europe (Erlinghagen, 2008), it seems likely that the health effects of job insecurity depend on both contextual and unmeasured individual factors.

7.4 Implications

7.4.1 Policy implications

This thesis suggests that the Great Recession has had negative effects on health, particularly in vulnerable groups, generating increased health inequalities. Some of this effect could be generated through individual unemployment exposure,[13] an effect mitigated by generous welfare policies but not by income reductions. This could indicate that services are more important than benefits, though the present empirical analyses do not permit such a conclusion. Nevertheless, combined with evidence from previous studies (Dencker-Larsen et al., 2016; Stuckler et al., 2009a), the positive health effects of ALMPs emerge as a plausible explanation of the less detrimental health effects of unemployment in countries providing

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[13] Nevertheless, it is important to emphasize that individual unemployment exposure is not found to predict poor SRH any better during than before the Great Recession. This means that it must be increased unemployment rates, not stronger health effects of unemployment, that contribute to the effect of the Great Recession on public health. Individual unemployment predicts fair SRH somewhat more strongly before than during the Great Recession, though the difference between the estimates was not tested.

more generous welfare policies. Other features of generous welfare states could also contribute, for example, their ability to reduce stigma and enhance trust.

Furthermore, the findings in this thesis indicate strong resilience towards external exposure. Although people tend to experience a marked drop in SRH when they become unemployed, the effect is reversed within two years. Whether this is due to adaptation or real improvement cannot be determined from the data, which nevertheless indicate some kind of resilience. When social workers assist the unemployed in their re-employment process, this resilience should not be underestimated. In addition to addressing the needs for psychological and financial support, social workers should also carefully acknowledge resources and resilience (Liem & Liem, 1988).

Coping with the health effects of unemployment is difficult, and getting a job if one is in ill health is probably at least as hard. This thesis suggests that social workers should be aware of the significant obstacles faced by people with impaired health when they seek work. These people could be discriminated against due to their health conditions or other individual characteristics that employers associate with low productivity (e.g., obesity). Social workers and other street-level bureaucrats should facilitate the social inclusion of vulnerable populations, including people in poor health. To some extent, this can be achieved by educating employers on the real pros and cons of hiring people with impaired health. However, facilitating social inclusion could also require policy interventions, for example, increased provision of ALMPs or giving employers incentives to hire people with impaired health.

7.4.2 Implications for future research

Establishing empirical support for causal links between exposure and outcome requires more longitudinal studies (Allison, 2009; Frasquilho et al., 2016; Gunasekara et al., 2011; Kröger et al., 2015; McKee-Ryan et al., 2005; Morgan & Winship, 2007). Longitudinal methods should also be used in comparative research. Studies of cross-national variation in *levels* (e.g., multilevel analyses of cross-sectional data) are usually biased due to differences in data collection, differences in questionnaire wordings, and cultural differences in how people respond to questions about health. As such, there is a need to investigate variation in trends. If

time-variant macro factors predict changing health *trends*, these cannot be driven by cultural differences or differences in data collection.[14]

Given that the Great Recession has contributed to deteriorating health and increased health inequalities, there is a need for further investigation of the mechanisms underlying these effects. This thesis demonstrates that unemployment transitions can explain some of the observed effects. However, other mechanisms, such as the impact of increasingly precarious and insecure working conditions, have not been sufficiently investigated (Frasquilho et al., 2016). Future research should examine whether, as well as for whom and to what extent, increased insecurity has mediated the health effects of the Great Recession.

All empirical analyses in this thesis control for partnership status, suggesting that the health effects of unemployment are not driven by partnership dissolution. However, becoming unemployed could be more stressful, and thereby have a stronger influence on health, if the exposed person is the breadwinner of the household, if both parents in dual-earner families become unemployed, or if the obligations towards other family members are comprehensive (e.g., responsibility for parents or several children). Such mechanisms are poorly investigated in the research literature, as are the impacts of the Great Recession and various policy responses intended to protect children's and adolescents' health. Future analyses would benefit from more detailed investigations of the health effects in different subgroups (e.g., across family types and among family members).

Future research should also distinguish between short- and long-term effects of the Great Recession. There is the possibility that unemployment is a stressful life event that may affect health in the future. Such long-term scarring effects of unemployment are of particular interest in public health perspective. For example, what happened to people who have remained unemployed for more than two years? Have they fared worse than those who were quickly re-employed? Although most countries have experienced recovery in terms of economic growth (GDP), many countries still have unemployment rates above 2008 levels. What has happened to those who finished their educations during the Great Recession? How will the Great Recession affect their life-courses? Such questions require different data and methods than those used in in this thesis.

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[14] Unless the culture or data-collection methods changed during the observational period.

8 Conclusion

This thesis analyses the effects of the Great Recession and generous welfare policies on population health and health inequalities in Europe.

What effects has the Great Recession had on health and health inequalities? The literature review (Study I) found that the Great Recession has led to deteriorating public health and increasing health inequalities. However, research designs, statistical methods, and health outcomes vary among the reviewed studies, making it difficult to compare their results. Furthermore, only a minority of the studies addressing the health effects of the Great Recession investigate whether these have led to increasing health inequalities, providing limited evidence for firm conclusions on that question.

Have generous welfare policies mitigated any possible negative effects? The results of Study II indicate that generous welfare policies are associated with more favourable health trends. However, these trends seem to be independent of how hard the countries were hit by the Great Recession, suggesting that generous welfare policies are not necessarily more important during an unfavourable economic climate.

Whether and to what extent are individual unemployment transitions associated with deteriorating health? Investigations of the individual health effects of unemployment transition suggest that unemployment has negative effects on health (studies III–V). Are these negative health effects mitigated by the generosity of welfare policies? Study IV suggests that this is the case. The effects of unemployment are less detrimental in countries providing more generous unemployment benefits and services, suggesting that generous welfare policies are important for the health of those directly exposed. Is this mitigating effect due to the mediating effect of income reductions and financial strain? The thesis provides some evidence for a mediating effect of financial strain, though the results do not indicate that declining income contributes to the health effects of individual unemployment (Study V). These seemingly contradictory findings are puzzling. However, they could imply that generous welfare policies have effects on health that go beyond the direct effects of policies on income.

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Appendices

Appendix 1: Supplementary material for Study I. Online sources

Reference list: http://www.hioa.no/Forskning-og-utvikling/Hva-forsker-HiOA-paa/Forskning-og-utvikling-ved-Fakultet-for-samfunnsvitenskap/Sosialforsk/gamle-sosforsk/Helseulikheter-oekonomisk-krise-og-velferdsstaten/Litteraturliste

Table: http://www.hioa.no/Forskning-og-utvikling/Hva-forsker-HiOA-paa/Forskning-og-utvikling-ved-Fakultet-for-samfunnsvitenskap/Sosialforsk/gamle-sosforsk/Helseulikheter-oekonomisk-krise-og-velferdsstaten/Tabell

Appendix 2: Links to metadata and information on all EU-SILC target variables

http://www.gesis.org/unser-angebot/daten-analysieren/amtliche-mikrodaten/european-microdata/eu-silc/

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Appendix 3: Aims, methods, exposure, individual-level outcomes, and results of studies

STUDY	AIMS OF STUDY	EXPOSURE	METHOD	OUTCOMES	RESULTS
Study I: Er økonomisk krise ensbetydende med helsekrise - hva forteller forskningen? [Is economic crisis equivalent to health crisis - what does the research say?]	To review and discuss research on how and to what extent the Great Recession has affected public health and health inequalities in European countries	The Great Recession	Scoping review	Mental and physical health, as well as health behaviours. Objective and subjective measures.	Most of the research finds deterioration in public health. Studies addressing health inequalities are fewer, but indicate increasing health inequalities.
Study II: Individual-level changes in self-rated health before and during the economic crisis in Europe	To investigate changes in SRH, and social inequalities in these changes, before and during the Great Recession in 23 European countries	Generosity of unemployment benefits and services	Mixed-effects ordinal logistic regression	SRH	The Great Recession accounts for an increasing trend in fair and poor SRH among the general working-age population of Europe, but the results do not indicate changing SES-related inequalities. Positive effects of generous unemployment benefits and services across degree of severity of the recession.
Study III: Unemployment transitions and self-rated health in Europe: A longitudinal analysis of EU-SILC from 2008 to 2011	To investigate changes in SRH connected to the event of becoming unemployed	Becoming unemployed + duration up to and since the unemployment spell	OLS + individual fixed effects regression	SRH	SRH decreases as people become unemployed, but predominantly among older workers. SRH tends to improve in the years after the unemployment spell. The discrepancy between the cross-sectional and longitudinal estimates indicate health selection into unemployment.
Study IV: Health effects of unemployment in Europe during the Great Recession: The impact of unemployment generosity	To investigate whether and to what degree generous unemployment benefits and services explain why the individual health effects of unemployment vary across Europe	Becoming unemployed + duration since unemployment spell. Both relationships are investigated by the generosity of unemployment benefits and services	Individual fixed effects regression + interactions	SRH	Countries with more generous unemployment benefits and services have less detrimental health effects of unemployment and less negative change in SRH during and in the first years after an unemployment transition.
Study V: Health effects of unemployment in Europe (2008–2011): A longitudinal analysis of income and financial strain as mediating factors	To investigate whether the effect of unemployment on SRH is mediated by income, financial strain, and unemployment benefits	Becoming unemployed, by level of income change, financial strain, and unemployment benefits	Individual fixed effects regression	SRH	Financial strain is found to be a potential mediator of the individual health effects of unemployment, while neither income nor unemployment benefits are found to be mediators of this relationship.

Study I

Dahl, E., Tøge, A. G., Heggebø, K., Elstad, J. I., Berg, J. E., & Halvorsen, K. (2015). Er økonomisk krise ensbetydende med helsekrise – hva forteller forskningen? [Is economic crisis equivalent to health crisis – what does the research say?] *Tidsskrift for velferdsforskning*, 18(2), 62–73.[1]

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[1] Links to supplementary material for Study I, including the reference list and table of the reviewed studies, are provided in Appendix 1.

Is economic crisis equivalent to health crisis: what does the research say?

Espen Dahl, Anne Grete Tøge, Kristian Heggebø, Jon Ivar Elstad, John E. Berg and
Knut Halvorsen

Introduction

The Western world has been hit by the worst economic crisis since the Great Depression in the 1930s. Aptly named the "Great Recession", the current crisis has manifested itself in housing bubbles, bankruptcies, credit drought, high sovereign debt, stock market declines, and sustained high unemployment, in particular, elevated youth unemployment in several countries. Now, five years since the crisis began, unemployment remains high, even though economic growth has recovered somewhat (OECD 2014a; Winsnes 09/11/2014). From many quarters, there is concern regarding the social consequences of the crisis. The OECD (2014b: 11) has expressed concern regarding the adverse long-term health consequences of the crisis, as joblessness is known to contribute to various health problems, not least impaired mental health. We have also seen a resurgence of research interest in the connections between economic crisis and health.

This article discusses this research into how and to what extent the crisis has altrered public health in the European countries affected and identifies what population groups may have been hit. The connection between the crisis and well-being is a matter barely considered in Norway, compared with the impact of the crisis on social conditions, e.g., mass unemployment, and in terms of economic phenomena, e.g., increased poverty and national economic stagnation or decline (see, e.g., TVF 4-2013). Examining health and its social distribution entails not only treating health as a value and an important aspect of well-being

but also emphasizing the possible long-term effects of harmful factors, particularly among young people. Though one would assume, and conventional wisdom would suggest, that economic crises are harmful to public health, as we shall see, historical health research into economic declines and recoveries does not report unambiguous findings.

Some claim that economic crises are detrimental to public health. Huijts (2014) writes: "Scientific studies suggest that health has also been seriously affected by the recession. Although some beneficial effects … have been reported … the consequences for health mostly appear to be harmful".

Several prominent "crisis scientists", for example, Stuckler, McKee, and Suhrcke, share this view. However, they articulate an important qualification, claiming that it is not the crisis in itself that affects the health status of the population, but the policies that nation states and international organizations enact in response to it. Stuckler and Basu (2013: xiv) maintain that "what we have learned is that the real danger to public health is not recession per se, but austerity". Austerity policies are considered not only a health hazard but also as unsuitable for reviving the economy post crisis.

Others claim the opposite: economic recession benefits public health; it is rather the recovery that is detrimental to public health. A prominent exponent of this view is the economist Christopher Ruhm (2003) who has written a number of articles on health and economic fluctuations. One is unequivocally entitled: "Good times make you sick" (Ruhm 2003), while a later article is simply: "Mortality increases during economic upturns" (Ruhm 2005). Our reading of the literature indicates that this belief is shared by several other scholars, particularly health economists, including key contributors such as Catalano, Goldman-Mellor, Saxton, Margerison-Zilko, Subbaraman, LeWinn, and Anderson (2011) and Granados (2014).

In light of such conflicting perceptions, it is uncertain how the current economic downturn in Europe is affecting public health and its social distribution.

Theories and approaches

What is it about economic crises that may affect public health and its social distribution? A dominant perspective is that of social determinants of health, which prompts studies of how certain living conditions and health-related behaviours are affected by economic crises. Spokespersons for both camps claim to apply this perspective, but emphasize different aspects

of it. Those who argue that crises can be detrimental to public health focus on unemployment and the fear of unemployment, lower incomes and deteriorating living conditions, poor nutrition, the weakening of social safety nets, as well as general insecurity, fear, and stress (Ruckert and Labonté 2014; Stuckler and Basu 2013). Those who claim that crises can benefit public health emphasize the negative effects of sedentary and work pressure, noting that economic weakness and the attendant unemployment results in less work stress, fewer work accidents, less road traffic and thus fewer accidents, lower consumption of alcohol and tobacco, less overeating, and more time for social contact and physical activity (Ruhm 2005). There are also several theoretical perspectives, but they are beyond the scope of this article.

Studies of health and economic crises range widely in design and methodical approach. Catalano et al. (2011) distinguish between studies at the individual and aggregate levels. Typically, individual studies compare health outcomes or the distribution of risk factors between those exposed and those not exposed to factors such as unemployment. Individual studies explore the relationships between macroeconomic variables such as gross domestic product (GDP) and individual health outcomes, possibly in different social groups, establishing macro–micro relationships. Aggregate studies examine the relationships between factors such as GDP and mortality rates (so-called net effects) in one or more populations, again establishing macro–macro relationships. The results of these two approaches often diverge, which, on reflection, is not that surprising. For example, there may be a positive correlation between crisis and self-rated health at the macro level, concurrent with a negative correlation at the micro level, for example, among the relatively few actually exposed to unemployment (Edwards 2008; Suhrcke and Stuckler 2012). Such group-specific information is highly relevant to policymakers in deciding how to address financial crises. Another important distinction is between studies of levels of health outcomes such as mortality, self-rated health, and chronic disease, and studies of the development and possibly the distribution of disease risk factors, e.g., physical activity, smoking habits, alcohol consumption, and eating habits. Different approaches do not necessarily yield the same results. A crisis could prompt higher, and more harmful, alcohol consumption, while also leading to improved health-promoting physical activity. In such a case, it is unclear what the net result would be in terms of mortality and morbidity, and how long it would take for various health outcomes to be observed.

A historic overview

History offers various natural experiments that permit the links between health and economic downturns and upturns to be tested. What lessons can we draw from the results of these studies?

One research approach is that of "case studies" of countries or groups of countries undergoing economic crises. The Great Depression has already been mentioned. It is interesting, and hardly common knowledge, that mortality continued to decline in the United States even during the worst of the crisis years during and after the stock market crash and the Great Depression of the 1930s (Stuckler and Basu 2013: 9). Nevertheless, not all population groups were affected equally. Walker (2010: 483–486) demonstrates that vulnerable groups, such as migrant labourers, fared disproportionately badly during the Great Depression. Russia after the fall of the Soviet Union is often cited as a horrific example of how badly public health can deteriorate under a severe crisis. Between 1989 and 1994, the mortality rate rose by 45 percent in Russia and life expectancy fell from 64 to 58 years among men and from 75 to 71 years among women (Chen, Wittgenstein, and McKeon 1996). Such a rapid and significant increase in mortality had rarely been seen before. The decline in life expectancy for people aged 20–65 years was primarily driven by adult men and women with low education. For example, men with university education experienced only a moderate and short-lived decline in life expectancy around 1990, after which it quickly rebounded. In contrast, the life expectancy of less educated men continued to fall during the 1990s and 00s, resulting in a dramatically increased inequality in life expectancy between these two educational groups (Murphy, Bobak, Nicholson, Marmot, and Rose 2006). This all too clearly illustrates the importance of examining whether and how the effects of crises are socially skewed. Another observation is that several countries that were part of, or dependent on, the former Soviet Union were also plunged into deep economic crisis with the dissolution of the USSR, but without the serious public health consequences experienced in Russia (Borowy 2011; Marmot 2004).

In the early 1990s, Sweden and Finland experienced economic recession but displayed no signs of deteriorating health or of increased socioeconomic inequalities in self-reported health (Lahelma, Kivela, Roos, Tuominen, Dahl, Diderichsen, Elstad, Lissau, Lundberg, Rahkonen, Rasmussen, and Yngwe 2002). These findings gave rise to the "buffer hypothesis" that the welfare system, which remained largely intact during and after the crisis, protected against adverse health consequences – not least for lower social strata. Studies of the Asian

economic crisis in the late 1990s reveal trifling changes in mortality trends, but an increased incidence of suicide in some countries (Chang, Gunnell, Sterne, Lu, and Cheng 2009). Social inequalities in mortality, mental health, and self-rated health increased in some Asian countries but not in others (Bacigalupe and Escolar-Pujol 2014: 2; Khang, Lynch, and Kaplan 2005).

Another approach includes the analysis of how health outcomes are correlated with more or less "normal" economic fluctuations and business cycles over longer periods. Early time series analyses concluded that economic crises were accompanied by higher mortality (Brenner 2005). A number of recent analyses applying more appropriate methods, including a study from Norway (Haaland and Counting 2015), have reached the opposite conclusion: recessions lead to lower mortality, while economic expansions are accompanied by higher mortality (Ruhm 2005). In these cases "higher" and "lower" refer to deviations from a long-term declining mortality trend. So-called procyclical is mortality primarily detected in wealthy countries (Bezruchka 2009). These empirical findings contribute to a related debate on whether inequality itself influences public health, or whether it is the *distribution* of wealth rather than wealth per se that affects public health in wealthy countries. This field of the crisis literature concentrates on normal economic cycles, not deeper crises such as the Great Recession. This raises the question of how to define economic crisis and its various dimensions.

A third methodological approach is that of meta-studies or systematic reviews, which often address specific health outcomes. Suhrcke, Stuckler, Suk, Desai, Seneca, McKee, Tsolova, Basu, Abubakar, and Hunter (2011) identified 37 studies of financial crises and the incidence of infectious diseases. Thirty of these studies found a correlation between recession and infectious diseases. Some reviews conclude that economic crises and unemployment lead to poorer mental health, including suicide, depression, and anxiety (Paul and Moser 2009; Uutela 2010). Mortality is another widely studied outcome. The meta-study by Falagas, Vouloumanou, Mavros, and Karageorgopoulos (2009) demonstrates that mortality increases in less wealthy countries during financial crises, but falls in rich countries with developed welfare systems. A review of articles on birth outcomes and crises concluded that a possible association between economic recession and birth weight, infant mortality, and secondary sex ratio (i.e., ratio of boys to girls at birth in a population) "remains speculative" (Zilko 2010: 465). Catalano et al. (2011) undertook a comprehensive meta-analysis of a number of health outcomes. They concluded that the undesired employment and economic experiences

following in the wake of economic crises increase the risk of mental and behavioural morbidity, while the evidence for somatic morbidity is divergent.

In short, historical experience is inconsistent, confusing, and contradictory. There are obvious differences between types of crises, the features of the societies in which they occur, and how the crises are handled politically. Finally, though importantly, research methods obviously make a difference – a matter to which we return towards the end of this article.

Anatomy of the current crisis

The current recession began as a financial crisis, but gradually evolved into a deep and persistent fiscal and economic crisis. Today, over five years since the crisis hit, the GDP of the OECD area is still lower than it was before the crisis (OECD 2014b: 11). The OECD (2014b) notes that the global financial crisis that began in 2007–2008 evolved into a social crisis over the five next years, and is now threatening many people's job prospects, livelihoods, and living conditions. A feature of the recent partial recovery is that although many countries have resumed economic growth, unemployment remains high. Most countries are now experiencing "jobless growth" and declining labour wages (OECD 2014b: 18). The OECD estimates that about 48 million people are seeking work in the OECD area – an increase of 15 million since 2007. However, some countries are notoriously worse than others. Among the hardest hit nations, besides Greece, are Ireland, Spain, Ireland, Iceland, Italy, Cyprus, and Hungary. Nevertheless, the effects of the crisis are socially skewed. Not unexpectedly, low-income groups have been among the hardest hit, along with the low-educated, young people, and families with children (OECD 2014b: 11). A study using data from the Luxembourg Income Study (LIS) demonstrated that welfare states of all types have compensated for loss of labour income among the unemployed, though many countries have failed to protect low-income earners, the poorest 20 percent suffering the biggest losses in disposable income during the 2007–2010 crisis years (Baird 2012). This illustrates that it is particularly important to study the implications of the crisis for health in different social strata.

Method: "scoping review"

This section reviews recent research into the link between crises in wealthy countries and public health, seeking insight into how, or whether, various social groups are affected. For various reasons, we did not endeavour to conduct an exhaustive systematic research survey like the Cochrane reviews (www.cochrane.org) or Campbell reviews

(http://www.campbellcollaboration.org). We carried out a "scoping review" rather than a complete, systematic literature review intended to achieve some kind of final synthesis. There is no common definition of what constitutes a scoping study. Our scoping study takes the form of a literature review, but one that is limited, preliminary, and conducts an exploratory mapping of the research literature. It covers empirical findings as well as key concepts and theories used in the literature (Levac, Colquhoun, and O'Brien 2010). Such surveys are important as they identify knowledge gaps and indicate where additional research is needed.

We searched the PubMed and Academic Search Premier databases for the 2009–December 2014 period using the keywords "health", "economic crisis", "recession", and "downturn". In addition, we searched the reference lists of the most recent articles, including several reviews, and checked the latest issues of selected key journals, i.e., *Social Science and Medicine*, *Journal of Epidemiology and Community Health*, *European Journal of Public Health*, and *International Journal of Equity in Health*. We were also in dialogue with researchers and research communities from several European countries, especially in those countries hardest hit, i.e., Ireland and the Southern European countries. The searches were not restricted to European countries, but only findings from European countries are reported here. Our table of review results presents only empirical, peer-reviewed studies and comparative empirical studies addressing European countries.

Results of the literature review

We have created a table (available at: www.hioa.no/sosialforsk/artikkel_helsekrise) reporting the key findings of the literature review. The table includes results from 46 studies published since 2009. As this was a scoping review, we cannot exclude that some studies may have escaped our notice. This review nevertheless provides a good indication of what characterizes research in this field and of the relationships between the current crisis and inequality in health outcomes.

The results of the review can be summarized in five main points:

First, there is a huge diversity of research approaches along several dimensions, the studies varying in design, analytical/statistical method, use of socioeconomic indicators, choice of health outcomes, etc. This diversity can be considered a strength, though it also undeniably makes it difficult to compare results across studies and countries. For example, it is not easy to know whether the differences between countries are due to actual conditions or to different research approaches.

Second, some countries are greatly overrepresented in the nation-based studies, while others are conspicuous by their absence. The UK, Greece, Italy, and Spain are well represented. Of the hardest-hit countries, Portugal is completely absent, and there are only three studies from Ireland. Of the Nordic countries, only Sweden and Finland are represented, and from continental Europe we find only Germany. One should therefore be extremely cautious in drawing overarching conclusions about how the current crisis has hit European countries in general. The material covers mainly countries that have been hard hit or relatively hard hit by the crisis, and the results must be interpreted in that light.

Third, the comparative studies of multiple countries (i.e., studies 1–5 in the table) consider mortality and selected causes of death. These studies largely confirm the historic experience of economic crises, finding that overall mortality has continued to fall during the current crisis, as Granados (2014) concludes: "In European countries in general and especially in those most affected by the crisis, general mortality has continued to decrease". Meanwhile, suicide rates have increased with higher unemployment rates and less public expenditures for social purposes. As demonstrated by research into previous crises, traffic fatalities have declined during the current crisis.

Fourth, the 45 studies analysing the relationship between the current crisis and public health outcomes often report multiple findings (52 in total). Of these findings, by far the majority (i.e., 30) support the hypothesis that crises are associated with poorer health or less healthy behaviour. This is not necessarily true for all population subgroups, as the studies are, for example, often limited to examining men only. There are also positive findings of the crisis being linked to better health or health-related behaviours. These eight positive findings essentially involve improved health behaviour such as reduced alcohol consumption, less smoking, and more physical activity. Fourteen findings indicate unchanged health or health-related behaviours, and the "no changes" category also includes uninterrupted trends.

The fifth main finding is increased health inequality during the crisis. Only a minority, 17 of 46 studies, provide information on how the crisis is associated with the development of health inequality, indicated by employment status, education, class, income, and local community deprivation. Several of these 17 studies report more than one finding. Thirteen studies confirm that inequalities are increasing, demonstrating that the crisis has coincided with higher prevalence of health problems or less healthy behaviour in lower social classes. In 13 of the studies, no significant changes in social inequality were reported, while four studies reported reduced health inequalities during the crisis.

We discuss this in detail below, commenting on the table according to the five main points. (Figures in parentheses refer to the numbering of the studies in the table.)

Variations in health outcomes and short- and long-term effects

One key question is how fast the health effects of a crisis manifest themselves and become measurable. The current crisis is still so recent that it has so far only been possible to measure the short-term effects over a maximum of a few years. Following the lifecycle perspective and the thesis of biological functions (Barker 1994), it is also possible that the long-term effects will not appear within this generation, as the stresses and strains that young children are exposed to today might not become manifest until the children become adults. Moreover, this is a question that cannot be considered independently of the nature of the particular health risks or health outcomes in question. Changes in mental health outcome, e.g., anxiety and depression, and self-rated health are observed more immediately than are changes in outcomes such as cancer and other somatic illnesses, which may have latency periods of several decades. An analysis of data from Hungary, for example, indicates that deaths from suicide peak 4–5 years after unemployment has peaked (Fountoulakis, Gonda, Dome, Theodorakis, and Rihm 2014). It is also possible that it takes some time for total mortality to stop falling and start rising, as observed in the most recently published mortality figures from Greece (2011–2012; study 20).

Having said this, a fairly clear pattern of the short-term effects of the current crisis is apparent. The occurrence of mental health problems, suicide, suicidal thoughts, and depression has increased during the crisis, while other health problems, including general premature mortality, have been little affected and appear to have continued their downward trend. Furthermore, some causes of death, such as traffic accidents, have clearly decreased during the crisis.

Characteristics of the crisis

Another important factor is what characterizes a particular crisis, i.e., how quickly it occurs, how long it lasts, whether it is financial, fiscal, or generally economic, and to what extent it affects the economic growth and/or unemployment rates. Simply categorizing countries according to how hard they were hit, measured in GDP decline or increased unemployment, provides little evidence for addressing this question, partly because studies addressing this question only exist for a few countries. However, Stuckler, Basu, Suhrcke, Coutts, and McKee (2009) demonstrate that the severity of a crisis, measured by the increase in

unemployment rates over the 1970–2007 period in the EU region, is associated with certain mortality outcomes. Large rises in unemployment (3% versus 1%) were accompanied by much higher suicide rates, homicide rates, and alcohol-related mortality. In this context, one comparative study of the current crisis is of particular interest. It compares changes in self-rated health in Greece and Poland, arguing that Poland is a counterfactual case, a claim that likely merits discussion. Nevertheless, the authors demonstrate that the development of self-rated health has clearly been more unfavourable in Greece than in Poland (14).

The role of welfare programs

An important question concerns the mechanisms leading from crisis to adverse health outcomes. The design of welfare programmes is expected to play an important role in this respect. Researchers who studied the health consequences of the recession in Sweden and Finland in the early 1990s were concerned with this, and introduced the buffer hypothesis to explain why economic decline was not associated with poorer health or greater health inequalities in the years that followed (Lahelma et al. 2002). A case study of Russia and Cuba after the Soviet collapse also illustrates this. Both countries were plunged into deep economic crisis. As mentioned, life expectancy fell dramatically in the USSR, while public health in Cuba was largely unaffected by the crisis. Borowy (2011: 1497) argues that different policy responses were essential, and that "political decisions go far to explain the difference".

To distinguish between the effects of the crisis per se and the effects of the policy responses to it, a robust design would be to group countries by these two dimensions. A test of the impact of policy would be to look at the health consequences in two countries (or groups of countries) more or less equally hard hit economically, for example, as measured by the reduction in GDP, one of which implements generous, supportive policies while the other implements strict austerity policies. However, it is difficult, if not impossible, to find qualifying countries or groups of countries, as there is a strong correlation between how hard the crisis hit and the resulting policy response. The OECD (2014b) demonstrated that the countries most affected (measured in decrease in GDP or higher unemployment) also implemented the strictest austerity policies, and vice versa, which is not particularly surprising. This means that it is difficult to distinguish the importance of a crisis as such from the importance of crisis management policy. We must therefore be satisfied with a non-optimal comparison.

An interesting pair of countries is Iceland and Greece. Both were hard hit by the crisis, although not equally hard. Their political responses to the crisis, however, were very different. Greece has undergone a far more powerful kill-or-cure remedy, in the form of a strict austerity policy, than has Iceland. Reliable comparisons of studies from the two countries are difficult to make, but as our table shows, several health parameters deteriorated not only in Greece, but also in Iceland, e.g. increased prevalence of hypertension (26). In Greece, the downward trend in mortality from cardiovascular diseases was disrupted by the crisis (19) and there are reports of both increased (16) and reduced health inequalities (15). In Iceland, income related inequality in self-rated health increased among men but remained unchanged among women. Despite the fact that Iceland has pursued a more humane policy response to the crisis than has Greece, signs of poorer health and greater health inequalities are also evident in Iceland.

Recent analyses confirm that the welfare system may play a health-protective role. It is demonstrated that the negative effect of unemployment on the suicide rate is moderated by the amount spent on active labour market policies in European countries (Stuckler et al. 2009), and that the more generous the social spending, excluding healthcare costs, the lower the total mortality (Stuckler, Basu, and McKee 2010). Similarly, in the OECD area, expenses for social purposes are negatively correlated with the suicide rate, especially in countries undergoing social crises (Park, Kim, Kown, and Shin 2009). An investigation of the variation in the degree of generosity of unemployment benefits between US states over time has demonstrated that the effect of unemployment on the suicide rate is counteracted by generous unemployment benefits (Cylus, Glymour, and Avendano 2014). Overall, this result supports those of studies demonstrating that the welfare system functions as a health-protective buffer when countries are hit by economic crises.

Public health and health inequalities?
Few studies specifically consider health inequalities and the welfare of disadvantaged groups. It is possible for a crisis to improve health in general while eroding the health of vulnerable groups. There are signs of economic crises having a positive effect on health in better-off groups, but a negative effect on vulnerable groups (Edwards 2008). In a review, Marmot, Bloomer, and Goldblatt (2013: 19–20) argue as follows:

> The impact of the economic crisis on health through its social determinants
> has the greatest effect on disadvantaged, low-income households as they are

more vulnerable to falls in income and are more likely to suffer the employment effects of an economic crisis.

If such is the case, economic crises reinforce and perpetuate long-term trends characterized by growing social inequalities. This is plausible, though when considering, for example, decreased smoking and more opportunities for physical activity, the net result is less obvious. A recent literature review specifically scrutinized the relationships between the current crisis and health inequalities in Europe. The authors identified seven relevant studies, three from the UK and four from Spain. They conclude that there has been no increase in health inequalities in the UK, while in Spain, inequalities in mental morbidity, health-related quality of life among children, perinatal health outcomes, and men's mental health have increased (Bacigalupe and Escolar-Pujol 2014: 2).

What does the table reveal? As mentioned, increased health inequalities are often reported, though there are also some signs of reduced health inequalities, such as smaller educational differences in depression in Greece (15). Nevertheless, one should be aware that this tendency in Greece is due to the higher incidence of depression among the highest educated. In light of political health equity objectives, this type of equalization is hardly desirable. As mentioned, a considerable number of studies find no significant changes in health inequality in Lithuania (12), Greece (18), or Iceland (25). Studies of health inequities are often based on surveys, which provide less statistical power than desired to provide robust estimates of changes over time between different social strata (25).

There is no necessarily consistent relationship between public health outcomes and health inequities. Improved public health may coincide with an increase in health inequalities, which, in terms of mortality, has been a normal trend in several European countries in recent years. However, the relationship can also be reversed: public health may deteriorate while health inequalities decrease. This was seen in Greece (15, 16), where higher rates of depression, suicidal thoughts, and suicide attempts co-occurred with smaller educational differences in these indicators; simultaneously, however, inequalities between the unemployed and the economically active increased for suicidal ideation and attempts.

Research methods and design

As is obvious from the table, we have far more extensive knowledge of the effects of the crisis on public health than of the effects on health inequality or outcomes for the

disadvantaged and vulnerable. It is also evident that the research field employs a variety of research designs and statistical methods, making comparisons across studies difficult.

Some designs are clearly more robust than others. As shown in the table, a repeated cross-sectional study compromises a series of studies, usually from before and during the crisis. Such a design does not permit acceptably reliable conclusions as to whether a change between two observations is caused by the crisis, is caused by other external shocks, or is simply an expression of a long-term trend.

Many of the individual-level studies are based on repeated cross-sectional samples taken before and during the crisis. In addition to the problem mentioned above, such an approach creates difficulties in interpreting changes in health estimates for specific, often volatile, groups, such as the "poor" or "unemployed". There are at least two interpretations of such pre–post estimates: the changes may be due to causal effects of the crisis, or to the changing composition of the investigated social category. When unemployment rises, the composition of the unemployed will likely change in a positive direction, and vice versa, though this is something that needs to be confirmed empirically. Health-related changes in more permanent social categories, such as educational or vocational classes, are less vulnerable to such compositional effects.

The many aggregated studies are vulnerable to criticism regarding the ecological fallacy (Catalano et al. 2011; Janlert 2009; Živine, Paczkowski, and Galea 2011). In cases in which findings from individual studies differ from those of aggregate studies, the difference may be attributable to this weakness. However, the two approaches may be answering different questions. Individual studies, such as investigations of the health consequences of exposure to unemployment in a society undergoing an economic crisis, are not equivalent to investigations of how an economic crisis is linked to a public health problem, as a crisis may affect the former without affecting the latter. For example, the relatively few unemployed may exhibit a higher risk of poor mental health, without this being expressed at the population level, and vice versa. In contrast, a crisis may cause an equivalent rise in the suicide rate among the employed and unemployed due to widespread insecurity in the general population (Janlert 2009).

Final considerations

The relationship between the "Great Recession" and public health is complex and still largely unclear. Our review of 46 European studies, which mainly treat countries hard hit by the

current crisis, indicates deterioration in public health. This is particularly notable for various indicators of mental and self-rated health. However, some health-related habits, such as smoking, have displayed a favourable trend during the crisis. Furthermore, many findings from 17 studies indicate increased health inequalities, though an equivalent volume of findings suggest unchanged inequalities. There are also a few findings indicating reduced health inequalities during crises.

There is a need for more robust studies of how crises affect disadvantaged groups and health inequalities. Strictly speaking, quite a few of the reviewed studies explicitly examine how the crisis has influenced health inequalities, employing sophisticated methods appropriate to addressing this question. Study number 28 in the table is a rare but good example of a study specifically designed to analyse income inequality in self-rated health before and during the crisis in Iceland.

Studies of the current crisis have understandably focused on short-term effects. It is important that future research should also build our knowledge of long-term effects and follow developments over time. This is particularly important if one is interested in whether and to what extent welfare systems act as buffers against the potential unhealthy consequences of the crisis, not least among young people. The diversity of research approaches and choices of health outcomes in the reviewed studies can be considered a strength, though it does hamper comparisons of results between countries and across approaches.

Finally, there is a need for theory that can help us understand when and under what social, political, and economic circumstances an economic crisis poses a serious threat to public health. The social determinants of health perspective seems to be predominant in the field, though it is more of a framework for understanding than a theory explaining the complex relationships found between economic crises and health. The associations are, as we have seen, far from unambiguous, as everything depends on the wider circumstances. A common finding is that the overall mortality rate has continued to fall, even during the current crisis. The social determinants of health perspective seems to imply reversibility: If the quality and level of the social determinants deteriorate due to economic crisis, population health will deteriorate. This also applies to health inequalities: If the social distribution of the social determinants of health becomes more unequal, health inequalities will increase. As we have seen, such expectations are not necessarily in consistence with empirical findings. Often, public health – measured, for example, as life expectancy – is surprisingly stable and resistant

to crises, the current one included. This may be because improvements in health behaviour outweigh the potential harmful effects of crises, or because the assumption of reversibility rests on faulty assumptions. The theory of "assets for health" can be useful here (Murray and Chen 1993). This theory directs attention towards material resources and infrastructure such as schools, hospitals, and sanitation systems, towards established knowledge and skills, as well as towards social institutions. In addition, routinized social practices, action sets, and ways people relate to each other are emphasized. Public health in general is not based on recent happenings, but on the long-term accumulation of varied health-related resources, with the time scale seldom being years, but decades and even centuries. According to this perspective, fluctuations in unemployment from one year to another will not create noticeable changes in public health. When a society has built up such "assets for health", it takes more than an economic crisis, such as "the Great Recession" to shake public health (Murray and Chen 1993).

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An overview of the literature reviewed in this study can be found here:

Study I - Norsk versjon

Er økonomisk krise ensbetydende med helsekrise – hva forteller forskningen?

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Innledning

Den vestlige verden er rammet av den verste økonomiske krisen siden den store depresjonen i 1930. Den er da også døpt «The Great Recession». Den innværende krisen har manifestert seg blant annet ved boligbobler, konkurser, kredittørke, høy statsgjeld, nedgang i verdiskapningen, og vedvarende høy arbeidsledighet, og i flere land ikke minst skyhøy ungdomsarbeidsledighet. I skrivende stund, fem år etter at krisa startet, har arbeidsledigheten bitt seg fast selv om den økonomiske veksten har bedret seg (OECD 2014a; Winsnes 09.11.2014). Fra mange hold kommer bekymringsmeldinger om krisas sosiale konsekvenser. OECD (2014b:11) har for eksempel uttrykt frykt for uheldige langsiktige helsekonsekvenser av krisa siden arbeidsløshet er kjent for å bidra til en rekke helseproblemer, ikke minst svekket mental helse. Vi har da også sett en oppblomstring av forskningsinteressen for sammenhengene mellom økonomiske kriser og helse.

Denne artikkelen tar for seg denne forskningen om hvordan og i hvilken grad krisa har gitt seg utslag på folkehelsa i europeiske land som er rammet og hvilke sosiale grupper i befolkningen

som eventuelt er blitt rammet. Krisas sammenheng med helse og trivsel («well-being») er en tematikk som i Norge er langt mindre påaktet enn krisas innvirkning på sosiale forhold som massearbeidsledighet og økonomiske fenomener som økt fattigdom og stagnasjon og nedgang i nasjonaløkonomiene (se for eksempel TVF 4-2013). Å rette søkelyset mot helse og dens sosiale fordeling innebærer ikke bare å framheve helse som en samtidig verdi og et viktig aspekt ved trivsel, men også å løfte fram mulige uheldige langtidsvirkninger av helseskadelige forhold, ikke minst for barn og unge.

I utgangspunktet skulle en anta – og konvensjonell visdom skulle tilsi – at økonomiske kriser er skadelig for folkehelsa, men som vi skal se gir ikke historisk helseforskning på økonomiske ned- og oppgangstider entydige funn.

Enkelte hevder at økonomiske kriser er skadelig for folkehelsa. Huijts (2014) skriver:

> … Scientific studies suggest that health has also been seriously affected by the recession. Although some beneficial effects … have been reported … the consequences for health mostly appear to be harmful.

Flere framtredende «kriseforskere» som Stuckler, McKee og Suhrke deler i hovedsak dette synet. Men, de anfører en viktig kvalifikasjon: tesen er at det ikke er krisa i seg selv som påvirker helsetilstanden i befolkningen, men den politikken som nasjonalstatene, og internasjonale organisasjoner velger å føre som respons på krisa. Stuckler og Basu (2013:xiv) hevder likefram at «What we have learned is that the real danger to public

health is not recession per se, but austerity». Sparepolitikk er ikke bare ansett som helseskadelig, men også som uegnet til å bringe økonomien ut av det dødvannet som krisa representerer.

Andre legger for dagen det motsatte synet; økonomiske nedgangstider gagner folkehelsa; det er snarere oppgangstider som er uheldig for folkehelsa. En framtredende eksponent for denne forestillingen er økonomen Ruhm som har levert en rekke artikler om helse og økonomiske fluktuasjoner. En artikkel har følgende utvetydige budskap i tittelen: «Good times make you sick» (Ruhm 2003). En senere oppsummeringsartikkel har kort og godt tittelen: «Mortality increases during economic upturns» (Ruhm 2005). Vår lesing av litteraturen viser at det dette er oppfatninger som deles av flere, og kanskje særlig helseøkonomer som i tillegg til Ruhm selv innbefatter sentrale bidragsytere på feltet som Catalano og Granados.

På bakgrunn av slike motstridende forestillinger er det ganske uvisst hvordan de nåværende nedgangstidene i europeiske land innvirker på befolkningens helse og dens sosiale fordeling.

Teorier og tilnærminger

Hva er det mer spesifikt ved økonomiske kriser som kan påvirke folkehelsa og helsas sosiale fordeling? En dominerende, overordnet tilnærming er perspektivet om helsens sosiale determinanter. Kort fortalt inviterer dette perspektivet til å studere hvordan utvalgte levekår og ulike typer helserelatert atferd påvirkes av økonomiske kriser. Talskvinner for begge leire påberoper seg dette perspektivet, men legger vekt på ulike aspekter ved det. De som argumenterer for at kriser kan være til ugunst for folkehelsa fokuserer på arbeidsløshet og frykt for arbeidsløshet, lavere inntekter og forverrede levekår, dårligere ernæring, svekkelse av sosiale sikkerhetsnett, og generell usikkerhet, frykt og stress (Ruckert og Labonté 2014; Stuckler og Basu 2013). De som hevder at kriser kan gagne folkehelsa betoner lavere aktivitet og tempo i arbeidslivet og derfor mindre stress og færre arbeidsulykker, mindre

veitrafikk og dermed færre trafikkulykker, lavere forbruk av alkohol og tobakk, mindre overspising, og mer tid for sosial kontakt og fysisk aktivitet (Ruhm 2005). Det finnes flere teoretiske perspektiver, men en behandling av disse faller utenfor rammen av denne artikkelen.

Studier av helse og økonomiske kriser spenner vidt i design og metodisk tilnærming. Catalano, Goldman-Mellor, Saxton, Margerison-Zilko, Subbaraman, LeWinn og Anderson (2011) trekker et skille mellom studier på hhv. individnivå og aggregatnivå. Typisk sammenlikner individstudiene helseutfall eller fordeling av risikofaktorer mellom de som eksponeres og de som ikke eksponeres, for eksempel for arbeidsledighet. Individstudiene eksplorerer sammenhengene mellom makroforhold som bruttonasjonalprodukt og individuelle helseutfall, eventuelt for ulike sosiale grupper – makro-/mikrorelasjoner. Aggregatstudiene tar for seg sammenhengene mellom for eksempel endringer i bruttonasjonalprodukt og endringer i dødelighetsratene (såkalte nettoeffekter) i en eller flere populasjoner – makro-/makrorelasjoner. Resultatene fra de to tilnærmingene divergerer ofte, noe som ved nærmere ettertanke ikke er så overraskende. For eksempel kan det tenkes å være en positiv sammenheng mellom krise og selvvurdert helse på makronivå, samtidig som det er negativ sammenheng mellom krise og selvvurdert helse på mikronivå, for eksempel for de (relativt få) som faktisk er eksponert for arbeidsledighet (Edwards 2008; Suhrcke og Stuckler 2012). Slik gruppespesifikk kunnskap er høyst relevant for hvordan politiske beslutningstakere skal møte økonomiske kriser. Et annet viktig skille går mellom studier som er opptatt av helseutfall som sådan, som totaldødelighet, selvvurdert helse og kronisk sykdom, og studier som retter søkelyset mot utviklingen og eventuelt fordelingen av risikofaktorer for sykdom. Typiske eksempler er helserelaterte atferder som fysisk aktivitet, røykevaner, alkoholkonsum og spisevaner. Et poeng er at ulike tilnærminger ikke nødvendigvis gir samme resultater. En krise kan samtidig føre til høyere – og mer helseskade-

lig – alkoholkonsum, men mer helsebringende fysisk aktivitet. Det er uvisst hva nettoresultatet for mortalitet og morbiditet blir, og hvor lang tid det tar før ulike typer helseutfall kan observeres.

Et historisk sveip

Historien tilbyr en rekke tilfelle av naturlige eksperimenter som er egnet til å teste ut sammenhengene mellom helse og økonomiske ned- og oppgangstider. Hvilke lærdommer kan vi trekke av disse?

En forskningstilnærming er «casestudier» av land, eller grupper av land som gjennomgår en økonomisk krise. Den store depresjonen er allerede nevnt. Det er interessant – og neppe allment kjent, at dødeligheten fortsatte å synke i USA selv under de verste kriseårene under og etter børskrakket og den store depresjonen tidlig på 1930-tallet (Stuckler og Basu 2013:9). Likevel ble ikke alle rammet likt. Walker (2010:483–486) viser hvordan den store depresjonen gikk hardest utover sårbare grupper som arbeidsimmigranter. Ofte trekkes Russland etter Sovjetunionens fall fram som et skrekkens eksempel på hvor galt det kan gå med folkehelsa under en alvorlig krise. Mellom 1989 og 1994 steg dødelighetsraten med 45 prosent i Russland og forventet levealder falt fra 64 til 58 år blant menn og fra 75 til 71 år blant kvinner (Chen, Wittgenstein og McKeon 1996). Slike hurtige og markante svingninger i dødeligheten har knapt vært observert tidligere i historien. Nedgangen i forventet levealder mellom 20–65 år gjaldt i første rekke voksne menn og kvinner med lav utdanning. For eksempel hadde menn med høy universitetsutdanning en moderat og kortvarig nedgang i dødeligheten rundt 1990. Deretter steg deres levealder raskt, i motsetning til menn med lav utdanning. For dem fortsatte levealderen å falle utover 1990 og 2000 tallet. Dermed økte også ulikheten i levealder mellom utdanningsgruppene dramatisk (Murphy, Bobak, Nicholson, Marmot og Rose 2006). Dette illustrerer med all mulig tydelighet viktigheten av å undersøke hvor sosialt skjevt kriser rammer. Et annet poeng å merke seg er at

en rekke land som var en del av, eller avhengige av, tidligere Sovjetunionen også ble kastet ut i dype økonomiske kriser, men uten at folkehelsa tok en på langt nær så alvorlig vending som i Russland (Borowy 2011; Marmot 2004).

Tidlig på 1990 tallet opplevde Sverige og Finland økonomiske nedgangstider. Det var ingen tegn til forverret folkehelse, eller økning av sosioøkonomiske ulikheter i selvrapportert helse (Lahelma, Kivela, Roos, Tuominen, Dahl, Diderichsen, Elstad, Lissau, Lundberg, Rahkonen, Rasmussen og Yngwe 2002). Disse funnene ga opphav til «bufferhypotesen», det forhold at velferdsordningene, som i det store og det hele var intakt under og etter krisa, beskyttet mot krisas ugunstige helsemessige konsekvenser – ikke minst for lavere sosiale lag. Studier av den asiatiske økonomiske krisa sent på 1990 tallet viser bagatellmessige endringer i dødelighetstrendene, men økt forekomst av selvmord i flere land (Chang, Gunnell, Sterne, Lu og Cheng 2009). Sosial ulikhet i dødelighet, mental helse og selvvurdert helse økte i noen asiatiske land, men ikke i andre (Bacigalupe og Escolar-Pujolar 2014:2; Khang, Lynch og Kaplan 2005).

En annen type tilnærming omfatter analyser av hvordan helseutfall samvarierer med mer eller mindre «normale» økonomiske fluktuasjoner og konjunkturer over lengre perioder. Tidligere tidsserieanalyser konkluderte at økonomiske kriser var ledsaget av høyere dødelighet (Brenner 2005). En rekke nyere analyser med bedre metoder, også fra Norge (Haaland og Telle 2015), kommer til stikk motsatte konklusjoner som antydet innledningsvis: lavkonjunkturer fører til nedgang i dødeligheten, mens høykonjunkturer følges av høyere dødelighet (Ruhm 2005). «Høyere og lavere» refererer i slike tilfelle til «effekter» som avviker fra en langsiktig synkende dødelighetstrend. Dødelighetens såkalte prosykliske variasjon er i første rekke påvist i velstående land (Bezruchka 2009). Dette er således et empirisk funn som bidrar til en tilstøtende debatt om hvorvidt ulikhet i seg selv influerer på folkehelsa og påstanden om at det er fordelingen av rik-

dommen snarere enn rikdommen per se som er avgjørende for folkehelsa i den velstående delen av verden. Denne kriselitteraturen fokuserer på mer normale konjunktursykler og ikke på dypere kriser ala den store resesjonen. Dette aktualiserer spørsmålet om hvordan økonomisk krise skal defineres og ulike dimensjoner ved økonomiske kriser.

En tredje metodisk tilnærming er meta-studier (systematiske oversikter), ofte av spesifikke helseutfall. Suhrcke, Stuckler, Suk, Desai, Senek, McKee, Tsolova, Basu, Abubakar og Hunter (2011) identifiserte 37 studier av økonomiske kriser og forekomsten av infeksjonssykdommer. 30 av disse viste en sammenheng mellom nedgangstider og forverring av utfall av infeksjonssykdommer. Et par oversikter konkluderer at økonomiske kriser og arbeidsledighet fører til dårligere mental helse blant annet i form av selvmord, depresjon, og angst (Paul og Moser 2009; Uutela 2010). Dødelighet er et annet mye studert utfall. Metastudien til Falagas, Vouloumanou, Mavros og Karageorgopoulos (2009) viser at dødeligheten øker i mindre velstående land under økonomiske kriser, mens den faller trendmessig i rike land med utbygde velferdsordninger. En oversiktsartikkel over fødselsutfall og kriser konkluderte at påstander om en sammenheng mellom økonomiske nedgangstider og fødselsvekt, spedbarnsdødelighet og sekundær kjønnsratio (tallforholdet mellom gutter og jenter ved fødsel i en populasjon) «forblir spekulative» (Zilko 2010:465). Catalano mfl. (2011) foretok en omfattende meta-analyse av en rekke helseutfall. De konkluderte med at uønskete jobb – og økonomiske erfaringer som følger i kjølvannet av økonomiske kriser øker risikoen for psykisk og atferdsrelatert sykelighet, mens evidensen spriker for somatisk sykelighet.

Kort sagt er de historiske erfaringene sprikende, uoversiktlige og motsetningsfulle. Det er åpenbart forskjell på kriser, på trekk ved det samfunnet de finner sted i, og på hvordan de håndteres politisk. Sist, men ikke minst spiller åpenbart forskningsmetodene en rolle. Vi kommer tilbake til dette mot slutten av artikkelen.

Den nåværende krisas anatomi

Den nåværende resesjonen startet som en finanskrise, men har etter hvert utviklet seg til en dyp og vedvarende fiskal og økonomisk krise. I dag, mer enn fem år etter at krisa inntraff, er bruttonasjonalproduktet i OECD-området fremdeles lavere enn det var før krisa (OECD 2014b:11). OECD (2014b) påpeker at finanskrisa som rammet globalt i 2007–08 i løpet av fem år har utviklet seg til en sosial krise ved å true mange menneskers jobbutsikter, inntektsgrunnlag og levekår. Et kjennetegn ved utviklingen den senere tid er at selv om mange land har gjenvunnet den økonomiske veksten, er arbeidsledigheten gjenstridig. De fleste land opplever nå «jobless growth» og nedgang i arbeidslønningene (OECD 2014b:18). OECD anslår at i OECD-området er om lag 48 millioner mennesker på jakt etter jobb – en økning på 15 millioner siden 2007. Men noen land er som kjent verre hjemsøkt enn andre. Blant de hardest rammede nasjonene er, foruten Hellas, Irland, Spania, Irland, Island, Italia, Kypros og Ungarn. Men krisa rammer også sosialt skjevt. Ikke uventet kommer lavinntektsgruppene dårlig ut, sammen med lavt utdannede, unge mennesker og familier med barn (OECD 2014b:11). En studie av data fra Luxembourg Income Study (LIS) viser at velferdsstater av alle typer har bidratt til å kompensere for arbeidsløses bortfall av arbeidsinntekter, men at mange land har sviktet spesielt overfor lavinntektstakere: De fattigste 20 prosent led de største tapene i disponibel inntekt under kriseårene 2007–2010 (Baird 2012). Dette illustrerer at det er spesielt viktig å studere krisas implikasjoner for helsetilstanden i ulike sosiale lag.

Metode: «scoping review»

Formålet med denne litteraturoversikten er å gi et innblikk i de siste årenes forskning på sammenhengen mellom krisetilstandene i de rike landene, folkehelsas utvikling, og ikke minst

hvordan, eller hvorvidt, ulike sosiale grupper er affisert. Av forskjellige grunner har ikke formålet vært å utarbeide en uttømmende systematisk forskningsoversikt ala Cochrane – eller Campbell review (www.cochrane.org, http://www.campbellcollaboration.org/). Vi har gjennomført en såkalt «scoping review» snarere enn en komplett, systematisk og syntetiserende litteraturoversikt. Det er ingen omforent forståelse av hva en scoping oversiktsstudie er. Vår «scoping studie» er en litteraturstudie som er en mindre omfattende, foreløpig og eksplorerende kartlegging av forskningslitteraturen på et område. Den dekker empiriske funn og i tillegg sentrale begreper og teorier som er brukt i litteraturen (Levac, Colquhoun og O'Brien 2010). For oss er en slik kartlegging spesielt viktig for å identifisere kunnskapshull og dermed avsløre hvor ny forskning trengs.

Vi har søkt i databasene Pubmed og Academic Search Premier for perioden 2009 fram til desember 2014. Vi har brukt søkeord som health, economic crisis, recession og downturn. I tillegg har vi gjennomsøkt litteraturlistene i de ferskeste artiklene, herunder flere oversiktsartikler, og sjekket de siste årgangene av utvalgte sentrale tidsskrifter som Social Science and Medicine, Journal of Epidemiology and Community Health, European Journal of Public Health og International Journal of Equity in Health. Vi har videre vært i dialog med forskere og forskningsmiljøer fra flere europeiske land, ikke minst de som er hardest rammet, det vil si Irland og sør-europeiske land. Søkene ble ikke avgrenset til europeiske land, men det er kun funn fra europeiske land som rapporteres tabellarisk her. I tabellen vår inngår empiriske, kun fagfellevurderte studier som har tatt for seg europeiske land samt komparative empiriske studier som inkluderer europeiske land.

Resultater av litteraturgjennomgangen

Vi har laget en tabell (som er tilgjengelig her: www.hioa.no/sosialforsk/artikkel_helsekrise) der vi gjengir utvalgt nøkkelinformasjon fra vår litteraturgjennomgang. Tabellen inneholder resultater fra 46 studier som er publisert siden 2009. Siden vi har gjort en scoping review kan vi ikke utelukke at enkelte arbeider har unnsluppet. Selv om vi ikke kan hevde at litteraturoversikten er uttømmende, gir den likevel en god pekepinn på hva som karakteriserer forskningen på feltet og hvilke sammenhenger mellom inneværende krise og (ulikhet i) helse som er dokumentert.

Resultatene i tabellen
kan oppsummeres i fem hovedpunkter:

For det første viser den at det et stort mangfold i forskningstilnærminger langs flere dimensjoner; de varierer etter design, analysemetoder, bruk av sosioøkonomisk indikator, valg av helseutfall med videre. Dette kan betraktes som en styrke, men er også unektelig en svakhet fordi det gjør det vanskelig å sammenlikne resultater på tvers av studier og land. Det er for eksempel ikke lett å vite om forskjeller mellom land skyldes faktiske forhold eller bruk av ulike forskningsmessige tilnærminger.

For det andre ser vi at noen land er kraftig overrepresentert i materialet av nasjonsbaserte studier, mens andre glimrer med sitt fravær. England, Hellas, Italia og Spania er godt representert. Av hardt rammede land er for eksempel Portugal helt fraværende. Fra Irland foreligger kun tre studier. Fra Norden er bare Sverige og Finland representert, og fra kontinental-Europa finner vi bare Tyskland. Dette betyr at en skal være ytterst varsom med å trekke bombastiske slutninger om hvordan dagens krise har rammet europeiske land generelt. Materialet dekker i hovedsak land som er hardt eller relativt hardt rammet av krisa, og resultatene må tolkes i lys av dette.

For det tredje, de komparative studiene av mange land (studie 1–5) fokuserer på dødelighet og utvalgte dødsårsaker. Disse studiene bekrefter langt på vei de historiske kriseerfaringene: Totaldødeligheten fortsetter å falle under den nåværende krisa, slik Granados (2014) konkluderer:

In European countries in general and especially in those most affected by the crisis, general mortality has continued to decrease.

Samtidig øker selvmordsratene og de øker med økt ledighet, og er mindre når de offentlige utgiftene til sosiale formål er mer omfattende. Som påvist for tidligere kriser, reduseres dødsulykker i trafikken også under den nåværende krisa.

For det fjerde, de 45 studiene som analyserer sammenhengen mellom inneværende krise og folkehelseutfall rapporterer ofte mer enn ett funn. Av disse funnene underbygger langt de fleste (30) hypotesen om at krisa er forbundet med dårligere helse eller usunnere helseatferd. Det gjelder ikke nødvendigvis alle befolkningskategorier, men er ofte avgrenset, for eksempel til kun menn. Likevel foreligger også positive funn, at krisa er knyttet til bedre helse eller helserelatert atferd. Disse 8 funnene dreier seg i det alt vesentlige om sunnere helseatferd, redusert alkoholkonsum, mindre røyking, og mer fysisk aktivitet. Det er 14 funn som indikerer uendret helse eller helserelatert atferd. Kategorien «ingen endringer» innbefatter også ubrutte trender.

Det femte hovedtrekket er at helseulikhetene øker under krisa. Kun et mindretall, 17 av 46 studier, gir informasjon om hvordan krisa er assosiert med utviklingen av sosial ulikhet, indikert ved sysselsettingsstatus, utdanning, klasse, inntekt og lokalsamfunnsdeprivasjon, i helse. Flere av disse 17 studiene rapporterer mer enn ett funn. 13 funn bekrefter at ulikhetene øker ved at krisa faller sammen med høyere forekomster av helseproblemer eller usunne helsevaner i lavere sosiale lag. I 13 tilfelle påvises ingen signifikant endringer i den sosiale fordelingen. I enkelte tilfeller (4) dokumenteres mindre helseulikheter under krisa. Vi vil drøfte detaljene i dette nedenfor og kommentere tabellen under fem overskrifter. (Tallene i parentesene refererer til nummereringen av studiene i tabellen).

Variasjoner i helseutfall og kort- og langsiktige effekter

En problemstilling er knyttet til hvor raskt helseeffekter av en krise manifesterer seg og blir målbare. Når det gjelder dagens krise er den såpass fersk at det så langt kun har vært mulig å måle korttidseffekter over maksimalt en håndfull år. Det er òg mulig at langtidseffekter ikke vil opptre før om en generasjon siden de belastninger og påkjenninger som små barn blir utsatt for i dag ikke blir manifeste før de blir voksne, jf. livsløpsperspektivet og tesen om biologisk programmering (Barker 1994). Videre er dette et spørsmål som ikke kan vurderes uavhengig av hva slags helserisiko eller helseutfall det er snakk om. Endringer i utfall som mental helse, for eksempel angst og depresjon, og selvvurdert helse, vil kunne observeres mer umiddelbart enn for eksempel kreft og andre somatiske sykdommer som kan ha en latenstid på flere tiår. En analyse av data fra Ungarn viser for eksempel at dødsfall forårsaket av selvmord topper seg 4–5 år etter at arbeidsløsheten har nådd toppen (Fountoulakis, Gonda, Dome, Theodorakis og Rihmer 2014). Det er også mulig at det tar noe tid før totaldødeligheten slutter å falle og begynner å stige slik det er antydning til i Hellas fra 2011 til 2012, det siste året med offentliggjorte dødelighetstall (studie 20).

Når dette er sagt synes det å avtegne seg noen temmelig klare mønstre av krisas korttidseffekter. Forekomsten av problemer som indikerer dårlig mental helse, som selvmord, selvmordstanker og depresjon øker under krisa mens andre helsemål, herunder generell prematur dødelighet, er lite affisert og ser ut til å fortsette sin nedadgående trend. Videre er det enkelte dødsårsaker som klart faller under krisa. Trafikkulykker er en slik dødsårsak.

Kjennetegn ved krisa

En annen viktig faktor er hva som kjennetegner krisa, hvor hurtig den inntreffer, hvor lenge den varer, om den er finansiell, fiskal, eller allment økonomisk, og i hvilken grad den berører den

økonomiske veksten og/eller arbeidsledigheten. En enkel inndeling av landene etter hvor hardt de er rammet – målt med nedgang i BNP eller arbeidsledighet – gir imidlertid få holdepunkter for å vurdere dette spørsmålet, blant annet fordi mange land mangler. Imidlertid viser Stuckler, Basu, Suhrcke, Coutts og McKee (2009) at krisas alvorlighetsgrad, målt med økning i arbeidsledighetsraten i perioden 1970–2007 i EU er assosiert med utvalgte dødelighetsutfall. En stor oppgang i arbeidsledigheten (3 % versus 1 %) ledsages av langt høyere selvmordsrate, drapsrate og i tillegg forhøyet dødelighet knyttet til alkoholbruk. I denne sammenheng er en komparativ studie av den nåværende krisa interessant. Den sammenlikner endringer i selvvurdert helse i Hellas og Polen og argumenterer for at Polen er et kontrafaktisk krisetilfelle, noe som nok kan diskuteres. Forfatterne viser at utviklingen av selvvurdert helse i Hellas er klart mer ugunstig i Hellas enn i Polen (14).

Velferdsordningenes rolle

Et viktig spørsmål er hvilke mekanismer som eventuelt leder fra krise til uheldige helseutfall. Her antas velferdsordningenes utforming å spille en viktig rolle. Helseforskere som studerte helsekonsekvensene av nedgangstidene i Sverige og Finland tidlig på 1990-tallet var opptatt av dette og lanserte bufferhypotesen som forklaring på at økonomisk nedgang ikke var forbundet med dårligere helse, eller større helseforskjeller i årene som fulgte (Lahelma mfl. 2002). En case-studie av Russland og Cuba etter Sovjetunionens kollaps illustrerer også denne problemstillingen. Begge land ble kastet ut i dype økonomiske kriser. Som nevnt falt levealderen dramatisk i Sovjet, mens folkehelsa i Cuba stort sett var uberørt av krisa. Borowy (2011:1497) argumenterer for at ulik politisk respons langt på vei var avgjørende: «… political decisions go far to explain the difference».

For å skille mellom effektene av krise per se og effektene av den politikken som føres, ville et potent design være å gruppere land etter disse to dimensjonene. En test på politikkens betydning, ville være å se på helsekonsekvensene i to land (eller to grupper av land) som er rammet om lag like hardt økonomisk, for eksempel målt med reduksjon i bruttonasjonalproduktet, men der det ene landet fører en raus og støttende politikk mens det andre fører en hardhendt innstrammingspolitikk. Det er imidlertid vanskelig, om ikke umulig å finne land som tilfredsstiller et slikt metodekrav. Grunnen er at det er en sterk sammenheng mellom hvor hardt krisa har rammet og hvilken krisepolitikk som landene fører. OECD (2014b) viser at de land som er hardest rammet (målt i nedgang i BNP eller økt arbeidsledighet) samtidig også fører en streng sparepolitikk, og omvendt, noe som neppe er særlig overraskende. Dette innebærer at det er vanskelig å skille betydningen av krise som sådan fra betydningen av krisehåndteringspolitikken. Vi må derfor nøye oss med det nest beste.

Et interessant par av land er Island og Hellas. Begge ble hardt rammet økonomisk, om enn ikke like hardt. Den politiske håndteringen av krisa er imidlertid svært forskjellig. Hellas har gjennomgått en langt kraftigere hestekur i form av en streng, og påtvunget, sparepolitikk enn Island. Pålitelige sammenlikninger av studier fra de to landene er vanskelige å foreta, men som tabellen vår viser er flere helseparametere forverret også på Island, for eksempel høyere forekomst av hypertensjon (26). I Hellas er den nedadgående trenden i hjerte- og kardødelighet brutt under krisa (19). I Hellas rapporteres både en økning (16) og en reduksjon av helseforskjeller (15). På Island har inntektsulikhet i selvvurdert helse tiltatt blant menn, men er uendret blant kvinner. Til tross for at Island har ført en mer human krisehåndteringspolitikk enn Hellas, er det også her tegn til dårligere folkehelse og større helseforskjeller.

Nyere analyser bekrefter imidlertid at velferdsordningene kan innta en helsebeskyttende rolle. Det er påvist at negative effekter av arbeidsledighet på selvmord modereres av hvor mye som brukes på aktiv arbeidsmarkedspoli-

tikk i europeiske land (Stuckler mfl. 2009); jo mer europeiske land bruker på sosiale utgifter, men ikke helsetjenesteutgifter, jo lavere er total-dødeligheten (Stuckler, Basu og McKee 2010). Tilsvarende er også vist i OECD-området: ut-gifter til sosiale formål er negativt korrelert med selvmord, spesielt i land som gjennomgår en sosial krise (Park, Kim, Kown og Shin 2009). En undersøkelse som har studert graden av ge-nerøsitet i arbeidsløshetstrygden mellom ameri-kanske delstater over tid viser også at effekten av arbeidsledighet på selvmordsraten motvirkes av rause ytelser til arbeidsløse (Cylus, Glymour og Avendano 2014). Alt i alt støtter disse analysene forestillingen om at velferdsordningene fungerer som helsebeskyttende buffer når land rammes av økonomiske kriser.

Folkehelse eller helseulikheter?

Det er stor mangel på studier som fokuserer spe-sielt på ulikhet i helse og hvordan vanskeligstilte grupper klarer seg. Det er selvsagt fullt mulig at en krise bedrer folkehelsa i stort, men svek-ker helsa til sårbare grupper. Det er tegn til at økonomiske krisetilstander kan virke positivt for helsa til bedrestilte, men negativt for vanskeli-gere stilte grupper (Edwards 2008). I en over-siktsartikkel framholder Marmot, Bloomer og Goldblatt (2013:19–20):

> The impact of the economic crisis on health through its social determinants has the grea-test effect on disadvantaged, low income ho-useholds as they are more vulnerable to falls in income and are more likely to suffer the employment effects of an economic crisis.

I så fall vil økonomiske kriser bidra til en for-sterkning og utvidelse av langsiktige trender kjennetegnet av økende sosiale helseforskjeller. Dette resonnementet er plausibelt, men hvis en også trekker inn for eksempel nedgang i røyking og større muligheter for mer fysisk aktivitet er «nettoresultatet» mindre opplagt. En fersk litte-raturoversikt har spesielt saumfart sammenhen-

gene mellom inneværende krise og helseulikheter i Europa. Forfatterne identifiserte 7 studier, 3 fra England og 4 fra Spania. De konkluderer med at det ikke er noen økning i ulikhet i helse i Eng-land. I Spania finner de økte sosiale forskjeller i mental sykelighet, helserelatert livskvalitet blant barn, perinatale helseutfall og i menns mentale helse (Bacigalupe og Escolar-Pujolar 2014:2).

Hva forteller vår tabell om dette? Som nevnt rapporteres ofte en økning av helseforskjellene, men det er også noen tegn til en reduksjon av helseulikhetene, som mindre utdanningsfor-skjeller i depresjon i Hellas (15). En skal imid-lertid være oppmerksom på at denne utjevningen skyldes høyere forekomst av depresjon blant de velutdannede. I lys av politiske likhetsmålsettin-ger er denne typen utjevning knapt ønskelig. Det er som nevnt også et anselig antall funn som ikke viser noen signifikante endringer i helseulikhet som i Litauen (12), Hellas (18) og Island (25). De studiene som har tatt for seg helseulikheter er ofte spørreundersøkelser og har derfor mindre statistisk styrke enn ønskelig for å gi robuste esti-mater på endringer over tid mellom ulike sosiale lag (25).

Det er ikke nødvendigvis overensstemmelse mellom utfall for folkehelse og utfall for helseu-likheter. En forbedring av folkehelsa kan falle sammen med en økning i helseulikhetene, noe som har vært en normal trend i flere europeiske land de siste årene når det gjelder dødelighet. Men det kan selvsagt også være omvendt: en fol-kehelseforverring kan finne sted samtidig som helseulikhetene reduseres. Dette ser vi for ek-sempel i Hellas (15 og 16): Høyere forekomst av depresjon, selvmordstanker og selvmordsforsøk opptrer sammen med mindre utdanningsfor-skjeller i disse indikatorene på mental helse, men samtidig øker forskjellene mellom arbeidsledige og yrkesaktive (gjelder kun selvmordstanker og -forsøk).

Forskningsmetoder og design

Som det er lett å se av tabellen vår, har vi langt mer omfattende kunnskap om krisas virkninger

på folkehelsa enn virkningene på helseulikhet og hvordan vanskeligstilte og sårbare grupper kommer ut. Det er også klart at forskningsfeltet byr på et mangfold av forskningsdesign og statistiske metoder. Dette gjør sammenligninger på tvers av undersøkelser vanskelig.

Enkelte design er åpenbart mer robuste enn andre. Som det framgår av vår tabell består en rekke studier av to tverrsnittsundersøkelser, ofte fra før og under krisa. Et slikt design gir ikke mulighet for å kunne si, med en tilfredsstillende grad av sikkerhet, om en endring skyldes krisa, andre ytre sjokk, eller om den er uttrykk for en langsiktig trend.

Mange av individstudiene er basert på surveyundersøkelser som er gjennomført på ulike utvalg en gang før og en gang under krisa. I tillegg til problemet nevnt ovenfor, skaper en slik tilnærming vanskeligheter med å tolke endringer i helse-estimater for spesifikke, ofte flyktige grupper som «fattige», eller «arbeidsledige». Det er minst to tolkninger av slike før-etter estimater: endringene kan skyldes kausaleffekter av krise, eller de kan skyldes endret sammensetning av den aktuelle sosiale kategorien. Det er sannsynlig at når arbeidsledigheten øker, så endrer sammensetningen av de arbeidsledige seg i en positiv retning, og omvendt, men dette er noe som må fastslås empirisk. Helsemessige endringer i mer permanente sosiale kategorier som utdanningsgrupper eller yrkesklasser er imidlertid mindre sårbare for slike komposisjonseffekter.

De mange aggregatstudiene er sårbare for kritikk av typen økologisk feilslutning (Catalano mfl. 2011; Janlert 2009; Zivin, Paczkowski og Galea 2011). I de tilfellene funn fra individstudier avviker fra aggregatstudiene, kan det skyldes denne svakheten. Men det kan også skyldes at de to tilnærmingene egentlig besvarer ulike spørsmål. Individstudier av for eksempel helsekonsekvenser av opplevd eksponering for arbeidsledighet i et samfunn preget av økonomisk krise, dreier seg om noe annet enn hvordan en økonomisk krise henger sammen med et folkehelseproblem. En krise kan påvirke førstnevnte

uten å påvirke sistnevnte, for eksempel ved at (relativt få) arbeidsledige oppviser høyere risiko for dårlig mental helse, men uten at det kommer til utrykk på befolkningsnivå og vise versa, for eksempel ved at krisa øker selvmordstilbøyeligheten for yrkesaktive og ledige like mye på grunn av utbredt usikkerhet i hele befolkningen (Janlert 2009).

Avsluttende betraktninger

Bildet av sammenhengen mellom «den store resesjonen» og folkehelse er sammensatt, og det er fortsatt mye som er uklart. Vår gjennomgang av 46 europeiske studier, som i hovedsak omfatter land som er hardt truffet av krisa, viser som regel en forverring i folkehelsa. Spesielt gjelder dette ulike indikatorer på mental helse og selvvurdert helse. Enkelte helserelaterte vaner, som eksempelvis røyking, viser imidlertid en gunstig utvikling under krisa. Mange av funnene fra i alt 17 studier indikerer også en økning av sosiale ulikheter i helse, men like mange antyder uendrete helseforskjeller. Det er også noen enkeltstående funn av mindre sosiale helseforskjeller i krisetider.

Det er behov for flere robuste studier av hvordan kriser påvirker vanskeligstilte grupper og sosiale ulikheter i helse. Strengt tatt er det få studier som eksplisitt studerer hvordan krisa influerer på sosiale helseforskjeller og som anvender mer sofistikerte metoder som er godt tilpasset slike problemstillinger. Studie 28 i tabellen er et sjeldent og godt eksempel på en studie spesielt designet for å analysere inntektsulikhet i selvvurdert helse før og under krisa på Island.

Undersøkelsene av den krisa vi er inne i har av naturlige grunner fokus på korttidseffekter. Det er viktig at forskningen også bidrar til innsikt om langtidseffekter, og dessuten overvåker utviklingen over lengre tid. Spesielt er dette et poeng om en er interessert i om og i hvilken grad velferdsordningene fungerer som en buffer mot krisers potensielle helskadelige konsekvenser, ikke minst for barn og unge. Mangfold i forskningstilnærminger og i valg av helseutfall kan

betraktes som en styrke, men vanskeliggjør sammenligninger av resultater mellom land og på tvers av tilnærminger.

Endelig er det behov for teori som kan hjelpe oss å forstå under hvilke tidshorisonter og under hvilke sosiale, politiske og økonomiske omstendigheter en økonomisk krise skaper alvorlige folkehelseproblemer. Perspektivet om helsens sosiale determinanter synes å være fremherskende på feltet, men det er mer et rammeverk enn en teori som kan forklare de komplekse sammenhengene vi finner mellom økonomisk krise og helse. Dette sambandet er, som vi har sett, langt fra entydig. Alt kommer an på. Et annet gjennomgående trekk er at den generelle dødeligheten fortsetter å falle også under den nåværende krisa. Perspektivet om helsens sosiale determinanter ser ut til implisere en prediksjon om reversibilitet: Om kvalitet og nivå på de sosiale determinantene svekkes på grunn av økonomisk krise, så vil folkehelsetilstanden få et tilbakeslag. Dette gjelder også for sosial ulikhet i helse: Om den sosiale fordelingen av de sosiale helsedeterminantene blir mer ulik, vil helseulikhetene øke. Som vi har sett, er det ikke nødvendigvis samsvar mellom slike forventninger og empiriske funn. Ofte er folkehelsesituasjonen – målt for eksempel som forventet levealder – forbausende stabil og motstandsdyktig mot kriser, den nåværende inkludert. Dette kan henge sammen med at sunnere helseatferd oppveier mulige helseskadelige virkninger, men det kan også være at antakelsen om reversibilitet hviler på sviktende forutsetninger. Teorien om «assets for health» kan være til hjelp her (Murray og Chen 1993). Teorien retter oppmerksomheten mot materielle ressurser og infrastruktur som skoler, sykehus og sanitærsystem, mot etablerte kunnskaper og ferdigheter og mot sosiale institusjoner. I tillegg vektlegges rutiniserte sosiale praksiser, handlingssett, og måter å forholde seg til hverandre på. Folkehelsetilstanden generelt er ikke grunnlagt på hva som har skjedd nylig, men på en akkumulert oppbygning av ulikeartete helserelevante ressurser over en historisk periode der tidsmålestokken sjelden er et år, men gjerne tiår, og endog hundreår. Ifølge

dette synssettet vil ikke fluktuasjoner i arbeidsledighet fra år til annet skape merkbar bevegelse i folkehelsesituasjonen. Når et samfunn en gang har bygd opp slike «assets for health», skal det mer til enn en økonomisk krise ala «den store resesjonen» for å ryste folkehelsa (ibid.).

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En samlet oversikt over litteratur som ligger til grunn for studien finnes her: www.hioa.no/sosialforsk/artikkel_helsekrise?

Study II

Abebe, D. S., Tøge, A. G., & Dahl, E. (2016). Individual-level changes in self-rated health before and during the economic crisis in Europe. *International Journal for Equity in Health*, 15(1), 1–8. doi: 10.1186/s12939-015-0290-8

RESEARCH

Individual-level changes in self-rated health before and during the economic crisis in Europe

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Abstract

Background: Changes over time in self-rated health (SRH) are increasingly documented during the current economic crisis, though whether these are due to selection, causation, or methodological artefacts is unclear. This study accordingly investigates changes in SRH, and social inequalities in these changes, before and during the economic crisis in 23 European countries.

Methods: We used balanced panel data, 2005–2011, from the European Union Statistics on Income and Living Conditions (EU-SILC). We included the working-age population (25–60 years old) living in 23 European countries. The data cover 65,618 respondents, 2005–2007 (pre-recession cohort), and 43,188 respondents, 2008–2011 (recession cohort). The data analyses used mixed-effects ordinal logistic regression models considering the degree of recession (i.e., pre, mild, and severe).

Results: Individual-level changes in SRH over time indicted a stable trend during the pre-recession period, while a significant increasing trend in fair and poor SRH was found in the mild- and severe-recession cohorts. Micro-level demographic and socio-economic status (SES) factors (i.e., age, gender, education, and transitions to employment/unemployment), and macro-level factors such as welfare generosity are significantly associated with SRH trends across the degrees of recession.

Conclusions: The current economic crisis accounts for an increasing trend in fair and poor SRH among the general working-age population of Europe. Despite the general SES inequalities in SRH, the health of vulnerable groups has been affected the same way before and during the current recession.

Keywords: Self-rated health, EU-SILC, Health inequality, Trends

Background

The impact of economic crisis on health is a global concern, particularly among vulnerable groups, such as youth, recent immigrants, single mothers, the less educated, and low-income households, as economic crisis could widen pre-existing inequalities in health [1, 2]. However, research provides little insight into changing health trends at the individual level and therefore limited evidence for casual mechanisms.

In general, individual vulnerability can be derived from two types of mechanisms, coping and social stress.

Coping mechanisms are individual processes, though they are influenced by the social environment. Witnessing how peers handle challenges both affects the perceived "normality" of given problems and provides information on successful ways of coping with them. If coping mechanisms are prevalent, one should expect decreasing negative effects of recessions as a larger share of the population is affected by their consequences [3–5]. Social stress theories postulate that individual stress is mitigated by personal, material, and social resources. The amount of transfer of such resources reduces the probability of risk factors becoming actual vulnerability [6]. During an economic crisis, the restricted availability of economic resources could limit people's abilities (particularly among those already

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Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 2 of 8

susceptible) to cope with both their own situation and interpersonal relationships [6]. There is no reason to believe that coping and social stress mechanisms vary between countries, however, these mechanisms might be important in explaining how changes in environment (that vary across countries) affect individuals.

An additional factor in this situation is the impact of welfare state systems and qualities [7], as it is not necessarily the actual economic crisis but rather the policy responses to it that determine the health impact [8–10]. The financial collapse and economic stagnation did not translate into adverse health outcomes in Iceland, a country that refused to bail out banks and implement austerity policies, while health changes are documented in countries that introduced austerity, such as Greece, Spain, and Portugal [11].

Regarding health inequalities, the research is inconsistent. For instance, findings from Greece, Lithuania, Poland, and Estonia indicate increased proportions of individuals with poor self-rated health (SRH) during the economic crisis [12–15], particularly among the unemployed [16], the elderly, and less-educated women [13]. However, a stable proportion of individuals with poor or even declining SRH was found among the general population in Finland [13] and Spain [16], respectively. Although income-related health inequalities were documented in Iceland, changes in SRH were found to be stable before and after Iceland's economic collapse [17]. As none of these studies examined individual-level changes in SRH across degrees of recession, they provide limited evidence regarding the causal effect of the crisis.

Most prior studies used a repeated cross-sectional design to compare changes in health outcomes before and after the economic crisis. Such designs are likely biased due to omitted time-variant variables [18], particularly changes in sample composition, which introduce uncertainty in determining a causal pathway from crisis and policy responses to health changes. Another challenge is short follow-up periods, which could mask outcome changes over time. Examining individual health changes using a long-term longitudinal design is recommended as it provides estimates closer to the causal effects. Such a design is also useful for subgroup analyses, as it allows trends in different social groups to be investigated [19–21, 13].

The current study examines changes in SRH before and during the economic crisis and how micro- and macro-level socio-economic status (SES) indicators relate to changes in SRH before and during the crisis in 23 European countries. The study specifically aimed to investigate trends and predictors of SRH across the severity of recessions – pre-, mild- and severe recessions – among the general working-age population in Europe. Exploring changes in SRH before and during the

economic crisis may provide important indications about the effects of economic crisis on health and health inequalities, which have important implications for the development of interventions to reduce social inequalities in health.

Methods
Participants
The data were extracted from two panels of the European Union Statistics on Income and Living Conditions (EU-SILC) from 2005 to 2011: 2005–2007 constitutes the pre-recession cohort and 2008–2011 the recession cohort. A balanced panel data structure was used. The sample population was further limited to the working-age population (25–60 years old) living in one of the 23 countries that participated in both periods.[1] The net sample included 65,618 respondents in 2005–2007 and 43,188 respondents in 2008–2011. The study and country-specific sampling procedure are thoroughly documented in MISSY – Metadata for Official Statistics.

During the recession period (2008–2011), we classified participants into mild- and severe-recession cohorts using changes in the median unemployment rates of countries between the pre- and during-crisis periods. Countries with a ≥1 percentage point increase in median unemployment during the crisis were regarded as experiencing severe recession, while those with a <1 percentage point increase were categorized as experiencing mild recession (see note in Tables 3 and 4 for the list of countries). This cut-off point corresponds to the median change in unemployment between the pre- and during-crisis periods in 23 European countries, i.e., 1.1 percentage points. Although GDP change is usually used to define recessions [22], change in unemployment is considered a better proxy for the social impact of recessions than is GDP growth because countries may experience "jobless growth," for example.

Dependent and independent variables
Outcome
Mean scores for self-rated health

SRH was measured using a single self-rated item, "How is your health in general?" Answers were ranked on a five-point scale, i.e., 5 = "very good", 4 = "good", 3 = "fair", 2 = "bad", and 1 = "very bad". Although this item is commonly used as a dummy variable, we opted to conduct the analyses using SRH as an ordinal variable. As ordinal categories could be unevenly spaced, i.e., the gap between those reporting "very good" and "good" could be small, while the gap between "good" and "fair" may be large [23], we thus categorized SRH into three levels, such that 0 = "very good or good", 1 = "fair", and 2 = "bad or very bad"/ "poor".

Predictors and control variables

Age was categorized into two groups: 0 = 25–40 and 1 = 40–60 years old. Male was coded as 0 and female as 1.

Education was measured according to the International Standard Classification of Education (ISCED), and was coded as 0 for those with secondary or lower education and 1 for those with tertiary education.

Unemployment was coded according to the self-reported status at the time of the interview: 1 = unemployed and 0 = employed.[2] Following the Mundlak approach [24], this variable was recoded into a variable denoting the within-individual mean (across time) and a variable denoting the time-specific deviation from this mean. The time-variant variable was then separated into two transitions: from employment to unemployment ("unemployment transition") and from unemployment to employment ("employment transition").

Welfare generosity, unemployment rates, and Gini coefficients were included as country-level variables. Welfare generosity refers to the yearly sum of social expenditure (purchasing power standard) per inhabitant on family/children, unemployment, sickness/healthcare/disability, and housing and social exclusion benefits, as there is more variation in the overall generosity than in how the spending is prioritised (see Additional file1). This sum is divided by the inverse of the employment rate among those 20–64 years old [25]. We used the average welfare generosity scores in 2004 and 2006 for the pre-crisis period and the average scores in 2008 and 2010 for the during-crisis period. Unemployment rates (in percent among those 25–74 years old), Gini coefficients, and GDP growth rates per year (2005–2011) per country were imported from the Eurostat database.

In addition, the following micro-level variables were included as covariates: baseline SRH, baseline employment status, marital status, and household income.

Statistical analysis

Mixed-effects ordinal logistic regression models were employed to investigate the individual-level changes and predictors of the SRH status over time (i.e., the 2005–2007 pre-crisis period vs. the 2008–2011 during-crisis period). These models are recommended for modelling individual trajectories over time in longitudinal studies, and have the advantage of controlling for dependence among the repeated responses of a subject [26, 27]. The following mathematical equation represents the basic model:

$$\mathbf{y_{ij}} = \boldsymbol{\beta_1} + \boldsymbol{\beta_2 \chi_{2j}} + \cdots + \boldsymbol{\beta_3 \chi_{3ij}} + \cdots + \boldsymbol{\zeta_{1j}} + \boldsymbol{\zeta_{2j} \chi_{ij}} + \boldsymbol{\epsilon_{ij}}$$

where y = outcome (SRH categories), χ = covariate (predictor), i = time point (occasion), j = subject, and ε_{ij} = residuals that are independent across subjects and occasions. The model has two parts, fixed and random effects. A fixed effect represents a single value, β, existing in the population and assumed to be shared by all individuals: β_1 = the intercept (i.e., starting point) and β_{2j} = the regression coefficient (i.e., mean slope) of time-invariant predictors (e.g., gender), while β_{3ij} = the regression coefficient of time-variant predictors (e.g., unemployment transition). For a linear trajectory, these estimates of the mean intercepts and slopes jointly define the underlying trajectory pooling of the entire sample. The random effects are estimates of the between-person variability in the individual intercepts and slopes. They describe subject-specific characteristics, i.e., ζ_{1j} and ζ_{2j} represent the random intercept and random slope in the basic equation, respectively.

For the purpose of study, the fixed effects (β) are presented and discussed. Since log odds ratios in ordinal logistic regression are not comparable across models due to unobserved heterogeneity and difficult to interpret because they are relative to the base outcome (i.e., very good/good SRH), results from multinomial ordinal regression models are presented as Average marginal effects (AME). AME eases the interpretation of results since they report the averaged change in probability ($P(y = 1)$) given the distribution of other independent variables for all observations. For all analyses, a *p*-value under 0.05 was considered statistically significant. Statistical analysis was conducted using Stata SE/13 for Windows.

Results

A descriptive summary of all variables and covariates over time is displayed in Table 1. Country-specific ordinal logistic regression models were first constructed to describe changes in the SRH status before and during the crisis period. As shown in Table 2, unadjusted regression estimates and standard errors are presented for each country (i.e., describing changes in the SRH status over time). In the pre-recession period, individuals in most countries had a stable SRH trend ($N = 14$, 60.8 %) or a declining trend in fair or poor SRH status ($N = 6$, 26.1 %), except individuals in Spain, Hungary and Netherland, who had significantly an increasing trend in fair or poor SRH over time. Individuals in elven countries (47.8 %) had stable or decreasing trends in fair or poor SRH before the crisis, but increasing in fair or poor SRH during the crisis. Still, individuals in eleven countries (47.8 %) maintained stable SRH during the crisis. Exceptionally, individuals in Spain displayed a declining trend in fair or poor SRH during the crisis.

To further examine the SRH trajectories and predictors, multivariate ordinal logistic regression models were applied according to the severity of recessions (pre-, mild- and severe-recession cohorts). Tables 3 and 4 present

Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 4 of 8

Table 1 Descriptive summary of study participants (balanced panel)

Variables	Pre-crisis period			During-crisis period			
	2005	2006	2007	2008	2009	2010	2011
SRH, N (%)							
Very good/good	35,715 (65.8)	36,145 (66.6)	35,489 (65.1)	25,626 (70.5)	25,307 (70.9)	25,467 (70.8)	25,056 (70.7)
Fair	13,641 (25.1)	13,514 (24.9)	12,264 (23.5)	8039 (22.1)	7873 (22.1)	7983 (22.2)	7722 (21.8)
Bad/very bad	4916 (9.1)	4642 (8.7)	4396 (8.4)	2668 (7.4)	2499 (7.0)	2518 (7.0)	2638 (7.5)
Age (years), N (%):							
25–40	27,169 (41.7)	26,921 (41.0)	25,415 (40.2)	16,900 (39.1)	16,372 (38.5)	16,134 (37.5)	15,642 (36.8)
40–60	38,014 (58.3)	38,697 (59.0)	37,766 (59.8)	26,288 (60.9)	26,267 (62.5)	26,897 (62.5)	26,821 (63.2)
Education, N (%):							
Less than tertiary	50,902 (78.1)	50,939 (77.6)	48,601 (76.9)	31,971 (74.0)	31,335 (73.5)	31,301 (72.7)	30,485 (71.8)
Tertiary	14,281 (21.9)	14,679 (22.4)	14,580 (23.1)	11,217 (26.0)	11,304 (26.5)	11,730 (27.3)	11,978 (28.2)
Employment status, N (%):							
Employed	46,065 (71.2)	47,330 (72.9)	46,291 (74.2)	32,495 (75.9)	32,672 (74.8)	31,868 (74.6)	31,630 (75.0)
Unemployed	4808 (7.4)	4349 (6.7)	3685 (5.9)	2241 (5.2)	2950 (6.9)	3335 (7.8)	3359 (7.9)
Other	13,834 (21.4)	13,246 (20.4)	12,397 (19.9)	8061 (18.9)	7731 (18.3)	7526 (17.6)	7162 (16.9)
GDP, M (SD)	3.44 (2.01)	4.76 (2.09)	4.82 (2.72)	0.97 (2.14)	−4.83 (4.00)	1.79 (1.73)	2.12 (2.06)
Gini, M (SD)	29.78 (4.41)	29.06 (4.07)	28.87 (3.73)	28.90 (3.69)	29.01 (3.97)	28.94 (3.96)	29.03 (3.75)
Welfare generosity, M (SD)	144.08 (98.31)	141.88 (97.33)	139.26 (96.25)	186.81 (118.01)	184.93 (117.93)	180.74 (117.47)	180.40 (117.39)
Unemployment rate per country, M (SD)	8.68 (4.22)	7.61 (3.13)	6.31 (2.14)	6.28 (2.31)	8.89 (4.07)	10.17 (4.77)	9.89 (4.66)

M mean, *SD* standard deviation, *N* number, *SRH* self-rated health (higher mean score indicates better SRH), and *GDP* gross domestic product growth rate

AME (standard error in parentheses) results for the fair and poor SRH status, respectively. In Model 1, first, we described changes in SRH over time across the degrees of recession. In Model 2, we then added micro- and macro-level factors to estimate how they independently predict changes in SRH among all individuals in the pre-, mild-, and severe-recession cohorts over time.

Results in Model 1 in the Tables 3 and 4 showed that significant declining trends in fair and poor SRH before the crisis, while increasing trends in the mild and severe recession cohorts. Multivariate results in Model 2 in the Tables 3 and 4 indicate that women had greater risk to experience fair and poor SRH than males in pre- and severe-recession cohort. The older age group displayed a more significant risk to fair and poor SRH than did the younger age group regardless of the degree of recession. Having tertiary education, transition to employment and living in more-welfare-generous countries were significantly associated with a lower risk to fair and poor SRH in all cohorts over time. Transition to unemployment was significantly positively related to fair and poor SRH regardless of the degree of recession. Living in a country with a higher Gini coefficient significantly predicted fair and poor SRH among individuals in the pre- and severe-recession cohorts.

Although univariate regression analyses showed that gender (β = 0.34, $p < 0.001$) and Gini coefficient (β = 2.69, $p < 0.001$) significantly associated with SRH over time in the mild recession cohort, these associations did not retain statistical significance in multivariate regression, which could be due to multicollinearity. Furthermore, the adjusted estimates of "time" in Model 2 in the Tables 3 and 4 revealed that trends in fair and poor SRH appear to decline with time in the mild recession cohort, while showed a stable trend in the severe recession cohort.

Discussion

This study found that the working-age population in European countries in general experienced an increasing trend in fair and poor SRH during the current crisis regardless of the severity of recessions. These changes in SRH during the crisis periods became stable or even declined in the fair and poor SRH status when adjusted to micro- and macro-levels predictors. This suggests that micro- and macro-levels predictors such as age, gender, levels of education, employment status, welfare generosity and Gini coefficients, could account for the SRH trends during the recession periods. However, the country-specific trends for the changes of SRH during the crisis period revealed mixed findings; about half of the countries studied had a stable SRH trend during the

Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 5 of 8

Table 2 Fixed effect estimates from multinomial ordinal logistic regression models describing individual-level changes in SRH over time before and during the economic crisis across 23 countries

Country	Pre-crisis period			During–crisis period		
	β	SE	Change[a]	β	SE	Change[a]
Austria	−0.025	0.055	S	0.091	0.040	I
Belgium	0.063	0.055	S	−0.041	0.047	S
Cyprus	−0.034	0.052	S	0.036	0.050	S
Czech Republic	−0.104	0.034	S	<−0.001	0.037	S
Denmark	0.082	0.095	S	0.132	0.060	I
Estonia	0.110	0.072	S	0.118	0.038	I
Spain	0.132	0.032	I	−0.065	0.025	D
Finland	−0.162	0.069	D	0.018	0.053	S
France	−0.069	0.098	S	0.162	0.025	I
Hungary	0.111	0.028	I	0.059	0.028	I
Iceland	0.319	0.165	S	0.116	0.107	S
Italy	−0.165	0.025	D	−0.037	0.020	S
Lithuania	−0.172	0.049	D	0.229	0.046	I
Luxemburg	−0.032	0.186	S	0.198	0.054	I
Latvia	−0.275	0.040	D	0.102	0.029	I
Netherlands	0.142	0.045	I	0.088	0.048	S
Norway	0.467	0.265	S	0.129	0.047	I
Poland	−0.106	0.020	D	−0.026	0.022	S
Portugal	−0.055	0.075	S	0.063	0.038	S
Sweden	−0.119	0.084	S	−0.031	0.063	S
Slovenia	−0.075	0.040	S	0.067	0.036	S
Slovakia	−0.079	0.049	S	0.085	0.040	I
UK	−0.055	0.041	S	0.170	0.046	I

β regression coefficients, *SE* standard error, *SRH* self-rated health
β represents regression coefficients measuring the probability of change towards fair or poor SRH status over time (i.e., very good/good SRH was a reference category)
[a]Indicates the individual patterns of change in the status of SRH over time: S = stable in SRH status, D = significant decline in fair or poor SRH status and I = significant increase in fair or poor SRH status

Table 3 Average marginal effects from multivariate multinomial ordinal models (fixed effects) showing micro- and macro-level predictors of fair SRH over time among countries during pre-, mild-, or severe-recession

Predictors	Pre-recession	Mild recession	Severe recession
	AME (SE)	AME (SE)	AME (SE)
Model 1			
Time (years)	−0.005 (0.001)***	0.003 (<0.001)***	0.005 (<0.001)***
Model 2			
Individual-level:			
Time (years)	−0.008 (0.001)***	−0.003 (<0.001)**	0.001 (0.001)
Gender (male vs. female)	0.014 (0.002)***	0.002 (0.003)	0.012 (0.002)***
Age (25–40 vs. 40–60 years)	0.116 (0.002)***	0.101 (0.004)***	0.078 (0.003)***
Tertiary education	−0.089 (0.002)***	−0.071 (0.004)***	−0.060 (0.003)***
Transition to employment	−0.062 (0.004)***	−0.097 (0.011)***	−0.038 (0.008)***
Transition to unemployment	0.074 (0.008)***	0.041 (0.012)**	0.039 (0.008)***
Country-level:			
Welfare generosity	−0.105 (0.002)***	−0.039 (0.004)***	−0.082 (0.004)***
Gini	0.077 (0.008)***	0.014 (0.019)	0.071 (0.012)***
Observations (person-years)	159,303	47,157	34,840
Number of participants	58,605	16,537	19,197
Number of countries	23	12	11

AME indicates the averaged change in probability (P(y = 1)) given the distribution of other independent variables for all observations. AME controlled for baseline employment status, marital status, household income, and GDP growth rate
Welfare generosity and Gini coefficients were transformed into natural logarithms
Transition variables had values ranging from 0 to 1, where 0 indicates "always employed" and 1 indicates "always unemployed" during the study period
Mild-recession countries were Austria, Belgium, Czech Republic, Finland, France, Luxembourg, the Netherlands, Norway, Poland, Slovakia, Slovenia, and Sweden
Severe-recession countries were Cyprus, Denmark, Estonia, Hungary, Iceland, Italy, Latvia, Lithuania, Portugal, Spain, and the UK
*** *p* < 0.001, ** *p* < 0.01, * *p* < 0.05; AME = average marginal effects; SE = standard error

crisis, while the rest half showed an increasing trend in fair and poor SRH, except individuals in Spain – experiencing a declining trend in fair and poor SRH during the crisis period. Future research should focus in examining underlying mechanisms explaining such country-specific variations in changes of SRH over time, which may add important insights in a debate about the impact of economic crisis on health and health inequalities.

We found no evidence of elevated health effects among vulnerable groups – low educated, unemployed and living in countries with less welfare generosity and increased inequality, whose SRH does not seem to be more affected by severe than mild or pre- recessions. Similarly, regarding exposure, the health effects of un-employment and employment transitions do not differ

significantly across severe-, mild-, and pre-recessions. This could indicate resilience and a substantial prevalence of coping mechanisms among the (assumed) vulnerable groups and individuals, which they may draw from family, social networks, and community resources [28].

In addition, this study identified SES indicators predicting SRH changes across the degrees of recession. For instance, although men have historically been found to

Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 6 of 8

Table 4 Average marginal effects from multivariate multinomial ordinal models (fixed effects) showing micro- and macro-level predictors of poor SRH over time among countries during pre-, mild-, or severe-recession

Predictors	Pre-recession AME (SE)	Mild recession AME (SE)	Severe recession AME (SE)
Model 1			
Time (years)	<-0.001 (<0.001)***	0.001 (<0.001)***	0.001 (<0.001)***
Model 2			
Individual-level:			
Time (years)	−0.003 (<0.001)***	−0.001 (<0.001)**	0.001 (0.001)
Gender (male vs. female)	0.006 (0.001)***	<0.001 (0.001)	0.006 (0.001)***
Age (25–40 vs. 40–60 years)	0.045 (0.001)***	0.033 (0.002)***	0.043 (0.002)***
Tertiary education	−0.034 (0.001)***	−0.023 (0.001)***	−0.033 (0.002)***
Transition to employment	−0.024 (0.002)***	−0.033 (0.001)***	−0.022 (0.004)***
Transition to unemployment	0.028 (0.003)***	0.013 (0.003)***	0.022 (0.004)***
Country-level:			
Welfare generosity	−0.041 (0.001)***	−0.013 (0.001)***	−0.045 (0.002)***
Gini	0.029 (0.003)***	0.005 (0.006)	0.039 (0.006)***
Observations (person-years)	159,303	47,157	34,840
Number of participants	58,605	16,537	19,197
Number of countries	23	12	11

AME indicates the averaged change in probability (P(y = 1)) given the distribution of other independent variables for all observations. AME controlled for baseline employment status, marital status, household income, and GDP growth rate

Welfare generosity and Gini coefficients were transformed into natural logarithms

Transition variables had values ranging from 0 to 1, where 0 indicates "always employed" and 1 indicates "always unemployed" during the study period

Mild-recession countries were Austria, Belgium, Czech Republic, Finland, France, Luxembourg, the Netherlands, Norway, Poland, Slovakia, Slovenia, and Sweden

Severe-recession countries were Cyprus, Denmark, Estonia, Hungary, Iceland, Italy, Latvia, Lithuania, Portugal, Spain, and the UK

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$; AME = average marginal effects; SE = standard error

be more vulnerable to deteriorating health during economic downturns [28], the present study found that women tended to be more affected than men before the crisis as well as among the severe recession countries, while no gender differences were found among the mild-recession countries. The growing participation of women in the labour market could be one explanation of this [28, 29]. Socio-demographic disparities in SRH also remained the same across the degrees of recession, those

who were older and less educated being more prone to SRH deterioration regardless of the degree of recession. Such persistence in socio-demographic inequalities over time is likely rooted in a person's life course [30], indicating that health among disadvantaged groups may have been affected the same way before and during the current recession.

The analyses also found that unemployment transitions significantly predicted the trend in SRH regardless of the degree of recession. Although the health of unemployed individuals is sometimes expected to decline with high unemployment rates [31], unemployed individuals have also been found displaying similar or even better mental health compared with employed individuals during periods of high unemployment [31–33]. Lower risks of self-blame and social stigmatization at times of high unemployment make it more acceptable to attribute individual unemployment to external causes. Such an increased tendency to externalize the causes of one's own unemployment may offset the unemployment-related stress stemming from a lower probability of reemployment. Hence, our results support the finding that the impact of transitions to unemployment or employment on SRH may not necessarily increase during recession periods.

The findings further indicated that welfare generosity can buffer the declining trend in SRH regardless of the severity of recessions. The effect of welfare generosity could imply that social stress processes supplement the coping mechanism [34], particularly for mental health among vulnerable groups, as the probability of participation in social networks increases in line with welfare generosity [25]. Additionally, changes in inequality indicated by increased Gini coefficients appear to be significantly related to declining SRH, though these associations are only significant in the pre- and severe-recession cohorts.

This longitudinal study is the first to examine individual SRH trends across degrees of recession using a large sample of individuals representing the working-age population of Europe, which lets us observe current macroeconomic changes and their effect on health. Unlike most prior studies, which find that selection into and out of unemployment moderates health changes [36], the longitudinal design of this study allows a comparative analysis of health changes across time and space, more directly investigating the impact of micro- and macro-level factors.

The study has some limitations warranting consideration. First, SRH is a rough measure of health, where it is impossible to distinguish between mental and physical symptoms. On the other hand, SRH measures self-perceived illness independent of diagnosis (disease) and societal acknowledgement of the health issues (sickness) [35], which means that SRH could be more sensitive to

Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 7 of 8

minor changes in health status than diagnosis and less sensitive to attitudes than sick-leave. Nevertheless, the reliability of SRH relies on the assumption that the respondents actually "know" their own health and report correct levels [36]. It is impossible to measure respondent's self-knowledge in health in the EU-SILC as there are only self-reported measurements. However, a literature review of 27 studies found that SRH represents an independent predictor of health status [37]. Second, unemployment rates were only applied to characterize the degree of recession. Although the unemployment rate is a prime indicator of recession, combining it with other macro-level indicators (e.g., proportion of workless households and real GDP) quantifying austerity and policy responses would provide an index better characterizing the degree of recession. Third, comparisons of trends in a given outcome across cohorts of countries could be broad and heterogenic, possibly creating non-differential misclassification bias resulting in underestimation of the true strength of an association between SRH changes and degree of recession. It also ignores the variations in the timing of economic crisis between countries. Moreover, a country-specific trend could differ from a cohort trend; as demonstrated in our analyses, about half of countries maintained stable SRH during the crisis period. Finally, differences in sample size across countries and over time accompanied by attrition difficulties make the panel sample less representative than it could be. Albeit our estimates are closer to the causal effects than in repeated cross-sectional studies, these limitations suggests that the results should not be interpreted as the true causal effect size.

Conclusion

This study examines the whole spectrum of SRH changes from pre-recession to mild- and severe-recession conditions among the general working-age population of Europe. Compared with previous research, it provides more accurate conclusions about the casual relationships between the SRH trend and micro- and macro-level indicators across periods of economic up- and downturns. Although micro- and macro-level SES predictors are significantly related to the SRH trend over time, no differences were found in the effects of such predictors across degrees of recession. This may imply that mechanisms underlying health inequalities appear to be similar between pre- and during recession periods, suggesting the persistence of health inequalities over time as well as stronger emphasis on interventions to prevent negative health effects among the vulnerable groups regardless of the severity of recessions.

Endnotes

[1]The following countries were included: Austria, Belgium, Czech Republic, Cyprus, Denmark, Estonia, Finland, France, Hungary, Iceland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Sweden, Spain, and the UK.

[2]The ILO definition of unemployment requires active job seeking. However, as many may have given up and no longer be actively job seeking, this definition is not useful as a measure of unemployment in this study.

Additional file

> **Additional file 1: Levels of social spending for different benefits among European countries in 2010.** (XLS 57 kb)

Abbreviations
EU-SILC: European union statistics on income and living conditions; ILO: International labor organization; SRH: Self-rated health.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
DSA and ED conceived the study, DSA ran the statistical analyses, and DSA and AGT wrote the first and subsequent drafts of the paper together. All authors revised the draft paper, provided critical comments, and approved the final version of the paper.

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Abebe *et al. International Journal for Equity in Health* (2016) 15:1

Page 8 of 8

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Study III

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Unemployment transitions and self-rated health in Europe: A longitudinal analysis of EU-SILC from 2008 to 2011

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ARTICLE INFO

ABSTRACT

The Great Recession of 2008 has led to elevated unemployment in Europe and thereby revitalised the question of causal health effects of unemployment. This article applies fixed effects regression models to longitudinal panel data drawn from the European Union Statistics on Income and Living Conditions for 28 European countries from 2008 to 2011, in order to investigate changes in self-rated health around the event of becoming unemployed. The results show that the correlation between unemployment and health is partly due to a decrease in self-rated health as people enter unemployment. Such health changes vary by country of domicile, and by individual age; older workers have a steeper decline than younger workers. Health changes after the unemployment spell reveal no indication of adverse health effects of unemployment duration. Overall, this study indicates some adverse health effects of unemployment in Europe — predominantly among older workers.

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1. Introduction

Following the Great Recession, unemployment rates in the European Union (EU-28) rose from 6.8 per cent in January 2008 to 10.0 per cent in January 2012 (OECD, 2014). Because it is well documented that unemployed people have poorer health than those who are employed (Bartley et al., 2005; Schmitz, 2011), this rise in unemployment has led to concern for the well-being and health of those affected (Catalano et al., 2011). Poorer health among the unemployed may be driven by various processes, including (1) causation — individuals becoming and remaining unemployed develop poorer health than those who continue working, and (2) health selection — individuals in poor health have elevated risks of becoming and staying unemployed. How far does self-rated health change when people move between employment and unemployment? This article investigates this issue using the panel of the European Union Statistics on Income and Living Conditions (EU-SILC) from 2008 to 2011.

1.1. Health selection

Health selection means that people in poor health are more likely to become and to stay unemployed than people in good health. The reasons can be that poor health leads to unemployment or that various other factors affect both health and employment prospects, sometimes labelled direct and indirect health selection (Steele et al., 2013). Using various indicators of health, several studies have found that people in poor health are more likely to become unemployed than those who are healthier (Korpi, 2001; Virtanen et al., 2013). Indicators include self-rated health (Elstad and Krokstad, 2003; Van de Mheen et al., 1999; Virtanen et al., 2005), psychological distress (Mastekaasa, 1996), number of self-reported health symptoms (Korpi, 2001), and longstanding illness (Arrow, 1996). Both Virtanen et al. (2013) and Korpi (2001) found that poor self-rated health increases the risk of becoming and remaining unemployed in Sweden, and Schuring et al. (2007) drew similar findings from a more comprehensive panel from 12 European countries. A study from Great Britain (1973–2009) shows that over the last decades, people with limiting longstanding illness have had increasingly lower probability of employment compared to their counterparts in better health (Minton et al., 2012). In Europe Reeves et al. (2014) find that health selection processes are reinforced in the recent years.

Some of this selection might be due to indirect health selection into unemployment, i.e. through the effect of underlying causes on health and employment status. In Germany, Arrow (1996) found that immigrants, women, young adults, and previously unemployed people are at particularly high risk of health selection into unemployment. In their 12-country study, Schuring et al. (2007) found an elevated risk of health selection among unmarried women, parents of young children, elderly people, and low-income groups. Low education and poor health may also increase the risk of remaining unemployed (Bartley and Owen, 1996; Korpi, 2001; van der Wel et al., 2011). Nevertheless, disentangling such indirect health selection from direct health selection requires sophisticated methods because health and social position cannot (and should not) be randomised. Using dynamic panel models, which address the effect of previous health on current health, Steele et al. (2013) found limited evidence for direct selection but strong support for indirect selection; unmeasured individual factors were associated with higher risk of both unemployment and ill health.

1.2. Causal effects

Longitudinal data allow for investigations into changes in health as individuals become unemployed as well as temporal changes in health before and after becoming unemployed. Such methods come closer to causal effects than cross-sectional comparison because they can filter out all time-variant individual characteristic leading to both unemployment and poor health (Gunasekara et al., 2014).

However, there could be individual characteristics that change over time that might affect both health and the probability of unemployment. For example, alcoholism or marital dissolution could lead to both unemployment and poor health. These would be examples of time-varying confounding and health selection effects. Longitudinal data typically allow for investigating some – but not all – such effects.

Flint et al. (2013) found that unemployment transitions were associated with a decrease in self-reported mental distress, suggesting that unemployment generates psychological stress. In a review of longitudinal research on health and unemployment, Catalano et al. (2011) found that job losers are twice as likely as those who remain employed to have increased symptoms of depression and anxiety. On average, job losers tend to increase their report of symptoms by 15–30 per cent, suggesting a possible causal link between unemployment and health. Nevertheless, studies investigating how health changes around the time that unemployment occurs could be contaminated by direct health selection (when a sudden health decline precedes unemployment) and indirect selection (when a third factor affects both outcomes).

For such reasons, some analysts believe that plant closures or major layoffs are better indicators of true causal effects than instances of individual unemployment (Jin et al., 1995; Morris and Cook, 1991). Schmitz (2011) found a greater decline in health as measured by hospitalisation, mental health scores and satisfaction with health among people unemployed for individual reasons than among people becoming unemployed as a result of closures or mass layoffs. For those unemployed because of a closure, a similar finding was discovered for hospital visits, but not for satisfaction with health or mental health. Schmitz (2011) argues that the divergent results for the two groups are due to health selection. However, cases of downsizing and individual job terminations could be perceived as the result of selection based on the individuals' characteristics, unlike closures that affect the entire staff (Mastekaasa, 1996). Individuals who are laid off individually may relate their job loss to their inadequate job performance or other unattractive individual characteristics, and this interpretation may be more stressful than collective unemployment due to closure. As such,

investigations of health effects of unemployment could benefit from a more direct investigation of health changes prior to unemployment.

1.3. Hypotheses

We hypothesise (1) that changes in health when people become unemployed can explain some of the health difference between employed and unemployed individuals. We also hypothesise that these effects of unemployment will vary by individual characteristics. Because unemployment is more common among younger people and they are more likely than older workers to be reemployed (Skärlund et al., 2012; Wanberg et al., 2002), we hypothesise (2) that older workers will suffer more adverse health consequences than younger workers on becoming unemployed. Because it is probably easier for women than men to adopt social roles other than that of "breadwinner" (Kuhn et al., 2009), we expect (3) that the health consequences of unemployment to be more adverse for men than for women. We also expect (4) the health consequences of unemployment will be less severe for highly educated than for less educated individuals. One reason is that employers might prefer more highly educated workers, making those with more education more likely to gain reemployment than those with less (Carling et al., 1996). More educated individuals may also have resources that make it easier for them to engage in alternative activities during periods of unemployment – for example, pursuing further education or training opportunities.

Finally we hypothesise (5) that the relationship between unemployment and health may vary between European countries. The current analysis makes no assumptions about the countries or country in which various characteristics predict better or worse health effects following individual unemployment.

1.4. Data and methods

This analysis uses data from the 2008–2011 panel of the European Union Statistics on Income and Living Conditions (EU-SILC). It uses 404,843 yearly observations from 189,177 individuals who were in the labour force (working or unemployed) and living in 28 European countries (i.e. the EU-28, excluding Germany and Ireland and including Norway and Iceland). The data have been harmonised according to European Parliament and Council regulation 1177/2003, and they comprise an extraordinarily rich source of employment information. All variables – dependent and explanatory – can vary between the up-till four yearly observations of each individual (2008–2011).

1.5. Dependent variable

The dependent variable is self-rated health, measured on a single item ("How is your health in general?") and ranked on a 5-point scale (5 = "very good", 4 = "good", 3 = "fair", 2 = "bad", and 1 = "very bad"). This item has been shown empirically to be a powerful predictor of future morbidity and mortality (Burström and Fredlund, 2001; Eriksson et al., 2001; Idler et al., 2000). In EU-SILC, this question has an overall response rate of 85 per cent.

1.6. Independent variables

Data on unemployment versus employment, the main independent variable of interest, were collected retrospectively from the EU-SILC, which provides information on the main activity over the previous 12 months. Full-time, part-time and self-employment were given the value 1, unemployment was given the value 0, and all other activities (e.g. education/training, unpaid work experience,

retirement, permanent disability/inability to work, compulsory military or community service, domestic responsibilities, etc.) were recorded as "missing". If more than one type of activity occurred in the same month, priority was given to economic over non-economic activity or inactivity.

Unemployment (unemployed at t) is coded 1 if the respondent is unemployed at the time of the interview, 0 if employed. *Unemployment transition* (employed at t-1, t-2 or t-3) is coded 1 if the respondent is observed to be employed at previous interviews, but had a transition into unemployment between baseline and interview. *Reemployment* (employed at t, unemployment transition at t-1 or t-2) is coded 1 if the respondent re-entered employment after an *unemployment transition*.

Health changes before and after the unemployment spell were investigated by utilising the time distance from the unemployment spell to the interview. To locate the exact month of unemployment transition, we created a job history file from the retrospective information on the main activity of each respondent for each month from 2007 through 2010. Transitions from employment to unemployment were recorded when at least three months of employment was followed by at least three months of unemployment. We then calculated the time from the month when a period of unemployment began to the time of the interview for all yearly observations. This variable was separated at zero to provide two variables, where *health trend before unemployment spell* denotes the temporal distance between interview and unemployment spell in the time before becoming unemployed while *health trend after unemployment spell* denotes the equivalent temporal distance in the time after becoming unemployed. On this variables, we recorded 7251 observations among 6156 individuals (mean = 1.18) before unemployment transition and 33,344 observations among 17,162 individuals (mean = 1.92) after unemployment transition. The unequal number of before and after unemployment observations is mainly attributable to the survey design. Respondents reported their monthly job history for the previous year at the time of the interview. Consequently, there will be more information on health after unemployment spells than before, providing stronger statistical power for health change after than the health trend before.

Time-varying covariates are current age (linear and squared), partnership (married or cohabiting) status and the number of dependent children (i.e. household members below 16 years) in the household. Disposable household income might mediate the effect of unemployment on health. This variable is recoded into logarithm because the impact of absolute changes may depend on the income level (Kawachi et al., 2010).

Gender and education level are time-invariant variables. Following Heggebø (2015) education is represented by two dummy-variables computed from the highest ISCED level attained. Pre-primary, primary and lower secondary is collapsed to *primary education*; (upper) secondary and post-secondary non-tertiary is collapsed to *secondary education* (reference category); and all higher educational qualifications are coded as *higher education*.

1.7. Statistical analysis

The data were analysed using linear regression models. Distributions in self-rated health were investigated using ordinary least squares (OLS) regression models, whereas changes in self-rated health were investigated using panel data models with individual fixed effects.

The OLS model estimates the mean self-rated health score among unemployed compared to the employed. Such estimates include both selection and causal effects. The fixed effects model estimates the within individual health change and thereby controls for all (measured and unmeasured) time-invariant confounding

effects (Gunasekara et al., 2014). Health selection due to fixed factors is thereby eliminated.

Fixed effects estimates might be contaminated by health selection if there is a short time span between declining health and the onset of unemployment (Gunasekara et al., 2014). This possibility is tested by estimating health changes prior to entering unemployment; the data reveal no such tendencies. A lagged dependent variable is endogenous and cannot therefore be included in a regular fixed effects model. Thus, to control for path dependency — i.e. that previous health predicts current health changes — we employ Arellano—Bond dynamic fixed effects estimation (Arellano and Bond, 1991), which is a Generalised Method of Moments (GMM) estimator particularly appropriate for short panels with large number of observations (Arellano and Bond, 1991; Bond, 2002; Cameron and Trivedi, 2010). The Arellano-Bond estimator eliminates potential omitted variables bias by first-differencing, before estimating a system of year specific equations where first lag regressors constitute an instrument for the lagged dependent variable (Cameron and Trivedi, 2010, pp. 293—303).

Transitions from work to unemployment are associated with lower income. How far income mediates the relationship between unemployment and health is tested in a separate model.

Three models investigate how far the health effects of becoming unemployed are modified by three individual characteristics using interaction terms between unemployment and gender (female dummy), age (linearized) and education level (two dummy variables). Whether the results vary between the 28 European countries is investigated using interactions between unemployment and country dummies controlling for covariates and age interactions. The coefficients are estimated at age 40 and country-variation is tested by an associated (27 df) F-test.

Because national sample sizes do not correspond to the size of the national workforces, all OLS and regular fixed effects models apply population weights that provide estimates representative of the European population. Population weights were calculated as the function of $\frac{p}{n}$, where p is the number of employees (aged 20—64) in the labour force, and n is the number of respondents in the analysis. Information on the number of employees (aged 20—64) in the labour force was extracted from Eurostat (2014). Test statistics are robust for heteroscedasticity and correct for the fact that repeated observations (2008, 2009, 2010 and 2011) for each individual are not statistically independent using the cluster option in Stata (2007). All tables present two-sided tests.

2. Results

2.1. Descriptive statistics

Table 1 reports descriptive statistics of the data. At one interview or more, 37,413 (10.9 per cent) respondents were unemployed, and 9472 (4.0 per cent) moved from employment (three months or more) to unemployment (three months or more) during the time covered by the job history data.

Self-rated health (1—5) has a mean value of 4.056 (SD = 0.761). Employed Europeans reported better health (4.081) than unemployed individuals (3.851). Respondents were aged on average 42 years (SD = 11.6) and had one dependent child (SD = 1.4) at the interviews. 71 per cent were married or cohabiting, 49 per cent had primary or lower secondary education as highest ISCED level attained, while 29 per cent had higher education; the remaining 22 per cent had upper secondary or some post-secondary education.

2.2. Transition and health change

Table 2 presents regression models of the correlation between

Table 1
Descriptive statistics.

	Definition	Frequency
Number of observations	Number of observations in the panel data	404,843
Number of respondents	Number of respondents in the panel data	189,177
Number of unemployment observations	Number of unemployment observations in the panel data. Unemployment = 1; self-employment or employed = 0; all other values = missing.	54,287
Number of unemployed	Number of respondents with unemployment observations in the panel data.	37,413
Number of unemployment transitions	Number of transitions from employment (0) to unemployment (1)	9197
Number of reemployments	Number of transitions from employment (0) to unemployment (1) and back to employment (0)	1409
		Mean (SD)
Variable	Definition	Weighted
Self-rated general health	1 (very bad) − 5 (very good)	4.056 (0.761)
Unemployed	Unemployment = 1; self-employment or employed = 0; all other values = missing. %	0.107 (0.309)
Secondary education	Highest ISCED level attained: Secondary and post-secondary non-tertiary.	0.488 (0.500)
Higher education	Highest ISCED level attained: 1st & 2nd stage of tertiary education	0.293 (0.455)
Trend before	Years from the current interview to the unemployment spell	−0.007 (0.076)
Trend after	Years from unemployment spell to next interview	0.083 (0.367)
Gender	1 = woman, 0 = man	0.466 (0.499)
Age	Age of respondents, centred at 40, divided by 10.	0.201 (1.119)
Age squared	Age of respondents, centred at 40, divided by 10.	1.293 (1.322)
Partnership	Married or living in a consensual union	0.710 (0.454)
Children	Number of persons under 18 years living in the household	1.147 (1.392)
Household income	Household disposable income (log)	10.092 (1.103)

unemployment and health. The OLS model (1) estimates cross-sectional differences between employed and unemployed, whereas the fixed effects model (2) estimates how health changes within individuals as they move between employment and unemployment.

Model 1 reveals a cross-sectional gap of 0.287 (SE = 0.006) in self-rated health between employed and unemployed individuals. The longitudinal estimate from the fixed effects model (2) shows that unemployment transitions are associated with significant change in subjective health (−0.038, SE = 0.008). In Model 3, the unemployment estimate is restricted to transitions from employment to unemployment because health change associated with reemployment is indicated by a separate coefficient. Transition into unemployment is still significantly associated with a decrease in self-rated health (−0.035, SE = 0.012). Reemployment is associated with an increase in self-rated health (0.043, SE = 0.027), however, the reemployment estimate is not statistically significant. The estimated health changes before and after entering unemployment indicate improved self-rated health (0.033, SE = 0.019 and 0.020, SE = 0.007), however, only the health change after becoming unemployed is statistically significant.

Adjusting for relative household income changes does not alter

Table 2
Self-rated health as result of unemployment and covariates.

	Model 1	Model 2	Model 3	Model 4	Model 5
	β (SE)	β (SE)	β (SE)	β (SE)	β (SE)
	OLS	Fixed effects	Fixed effects	Fixed effects	Dynamic fixed effects
Unemployment (unemployed at t)	−0.287*** (0.006)				
Unemployment transition(s) (employed at t-1, t-2 or t-3)		−0.038*** (0.008)	−0.035** (0.012)	−0.035** (0.012)	−0.039** (0.015)
Reemployment (employed, unemployed at t-1 or t-2)			0.043 (0.027)	0.043 (0.027)	0.014 (0.021)
Health trend before unemployment spell			0.033 (0.019)	0.033 (0.019)	
Health trend after becoming unemployed			0.020** (0.007)	0.021** (0.007)	
Log household income				0.004 (0.003)	
Self-rated health (t-1)					−0.192*** (0.016)
Covariates:					
Woman	Yes	No	No	No	No
Age, Age^2, Marital/cohabitation status, Number of children	Yes	Yes	Yes	Yes	Yes
Number of observations	404,843	404,843	404,843	404,821	72,984
Number of individuals	189,177	189,177	189,177	189,175	70,804
R^2	0.073				
R^2 (FE within)		0.004	0.004	0.004	Not applicable

OLS and fixed effects models are population weighted. Population weights are not applicable on dynamic fixed effects models.
Robust standard errors in parentheses. * = $p < 0.05$, ** = $p < 0.01$ & *** = $p < 0.001$ in two-sided tests.

the main result; Model 4 shows that the unemployment estimate, as well as the health change after the unemployment spell, still reveals a significant increase in self-rated health, while reemployment remains insignificant. Even when we control for previous health, which is a highly predicative factor (-0.192, SE = 0.016), the significant negative correlation between unemployment transition and self-rated health sustains (Model 5). The number of observations in this last model is substantially lower than in the former models as estimation depends on information at t-1 (Cameron and Trivedi, 2010).

Table 3 investigates whether and how far the longitudinal unemployment effect from Model 2 varies by gender, age, and educational level. Models 6 and 8 suggest no gender or educational differences, while model 7 suggests age differences.

The age variable is centred on 40 years (age $-$ 40) and then divided by 10 (indicating a 10-year change). The estimates in Model 7 (-0.031, SE = 0.009) indicate virtually no health change following transitions between employment and unemployment among individuals aged under 25 years but a strong decrease in self-rated health when older workers move into unemployment, for example a drop of 0.078 ($0.016 + 0.031*2$) for workers who become unemployed at age 60 ([$60-40$]/10 = 2).

2.3. Between-country variation

The interactions between unemployment and country dummies are reported in Fig. 1, and the variation is statistically significant ($p < 0.001$ using a 27 df F-test). These country specific results were estimated using Model 7 (interaction term between unemployment and age) plus an additional interaction term between unemployment and country of living (N = 28). Model 7 is used because the age distribution of those becoming unemployed varies between the 28 countries, which affect the country level comparison. The graph shows that the largest health effects from transition into unemployment were in Sweden, Romania, Croatia and Hungary. In contrast, transitions into unemployment were associated with an increase in self-rated health in some of the investigated countries such as Spain, Iceland and Estonia.

3. Discussion

The 2008 economic crisis has manifested itself in increased, and for several countries historically high, unemployment rates. Because the recession has been long-lasting and unemployment rates have remained high, there is good reason to be concerned about the welfare of those entering unemployment. Even a small individual health effect of unemployment could have substantial impact on health if accumulated at population level. This analysis investigates the association between a transition into unemployment and change in subjective health. In line with Flint et al. (2013), we find a decrease in self-rated health as people enter unemployment, providing some support for a potential causal effect.

The results further indicate that individuals who experience unemployment transitions are in poorer health than the stable employed because the cross-sectional difference in health between employed and unemployed individuals is much larger than the health change associated with transitions between employment and unemployment. The deviation between cross-sectional and longitudinal estimates could indicate direct or indirect health selection mechanisms. However, this study cannot distinguish between these mechanisms nor determine the exact overall size of these selection effects.

Previous research shows that workers in poor health are more likely than healthy workers to become unemployed (Korpi, 2001; Virtanen et al., 2013). According to Reeves et al. (2014), such health selection effects have been strengthened over recent years in Europe, particularly in countries hardest hit by the Great Recession (Reeves et al., 2014), which indicate that the current recession has made health an even more important employment factor than it was in periods with better employment opportunities.

We find no tendency that subjective health deteriorates before people become unemployed. The reason could be that more severe changes in health would most likely result in transitions into a disabled status rather than remaining economically active and continuing to search for a job.

The results indicate that subjective health tends to improve over the first few years after becoming unemployed, also when controlling for reemployment and relative income changes at household level (Table 2, Models 3 and 4). This finding could be attributable to various adaption processes. There is the possibility that entering unemployment is a stressful experience and that some individuals eventually learn to cope with the new situation. Further, unemployment might have both positive and negative effects, and positive effects such as fewer physically or mentally demanding job requirements could balance the negative effects such as lower income and social position. Those who learn to live with this situation may adjust their expectations. Brickman and Campbell (1971) describe this psychological mechanism of adjusting our emotional system to new circumstances as the hedonic treadmill (see also Diener et al., 2006; Kahneman et al., 2004). The implication is that any life event leading to a better or worse situation tends to have relatively short-lived effects on individuals' subjective judgements of well-being, including subjective health.

This analysis cannot distinguish between the two explanations

Table 3
Self-rated general health. Interactions with unemployment transition.

	Model 6	Model 7	Model 8
	β (SE)	β (SE)	β (SE)
	Fixed effects	Fixed effects	Fixed effects
Unemployment transition (employed at t-1, t-2 or t-3)	-0.020 (0.014)	-0.015 (0.011)	-0.037^* (0.015)
Interactions with unemployment transition:			
Women	0.006 (0.021)		
Age		-0.031^{***} (0.009)	
Primary education (secondary education reference category)			0.024 (0.023)
Higher education (secondary education reference category)			0.036 (0.030)
Covariates			
Reemployment, Age, Age^2, Marital/cohabitation status, Number of children	Yes	Yes	Yes
Number of observations	404,843	404,843	401,154
Number of individuals	189,177	189,177	187,438
R^2 (within)	0.003	0.003	0.003

Population weighted. Robust standard errors in parentheses. $^* = p < 0.05$, $^{**} = p < 0.01$ & $^{***} = p < 0.001$ in two-sided tests.
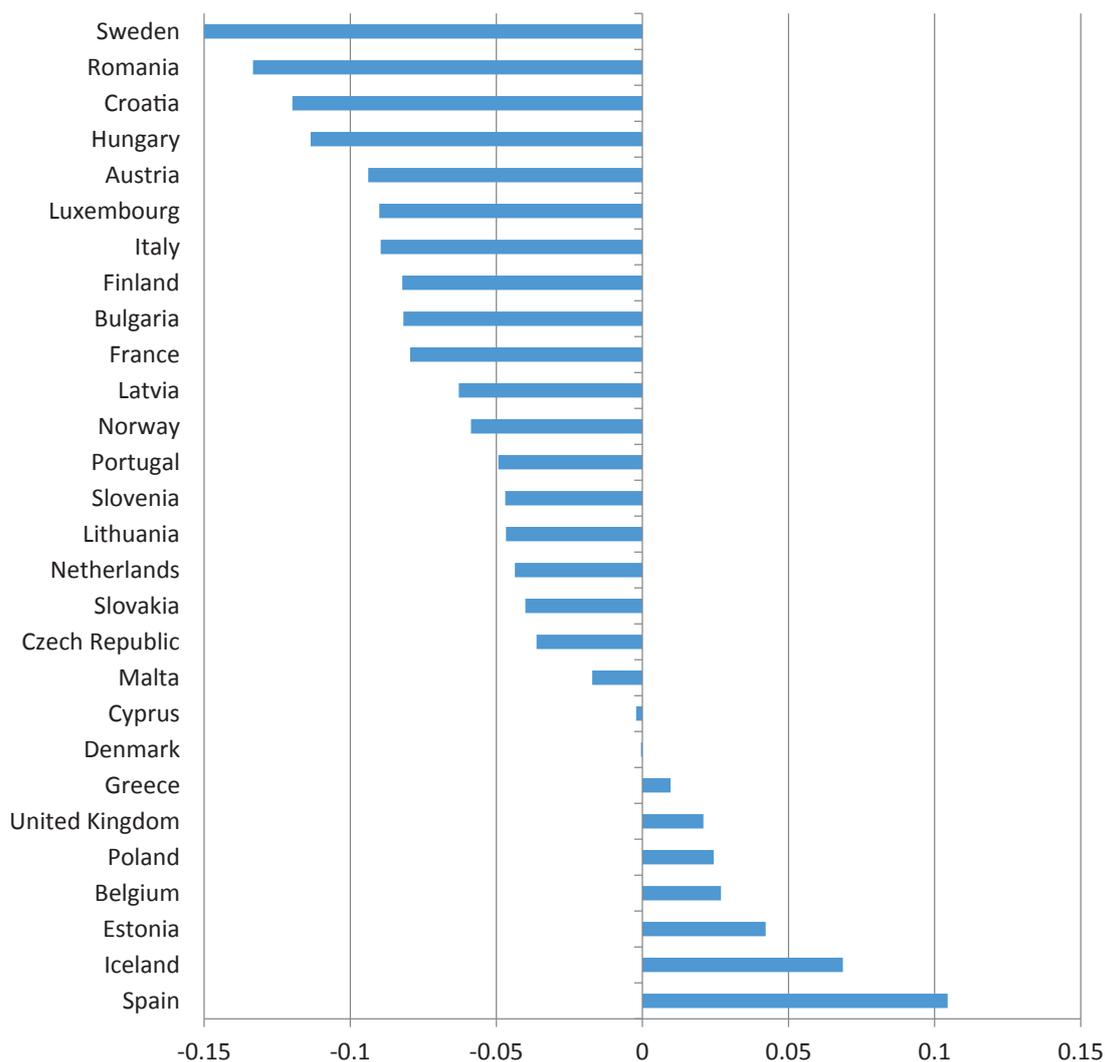
Fig. 1. Unemployment transition at age 40. Country specific estimates (Model 2, $p < 0.001$ using a 27 df F-test).

to say whether individuals learn how to live with being unemployed or if they merely adapt their subjective judgements in relation to being unemployed. More objective indicators of health could perhaps help to distinguish between the two explanations. However, in contrast to subjective health, which may change abruptly, most objective indicators of poor health develop or change so slowly that they are difficult to investigate longitudinally. Levels of cortisol, a stress hormone obtained from hair analysis, indicate no reduction in stress over the first one or two years of unemployment (Dettenborn et al., 2010). In light of current research, the implication of such stability in stress levels after unemployment could be that unemployed individuals merely adjust their subjective judgements around being unemployed, although they still experience stress. Those who do not adapt to unemployment may, on the other hand, become "discouraged workers", and say that they are "permanently sick" or "economically inactive". As a result, the unemployed group might look healthier each year relative to those employed. More remains to be known about how individuals adapt to unemployment, including the consequences for their health.

All major results are similar for men and women. This finding is in line with the majority of previous longitudinal studies (Catalano et al., 2011). Although women might have a wider range of alternative social roles when becoming unemployed (Kuhn et al., 2009), unemployment seems to affect the subjective health of men and women similarly.

We also hypothesised that more educated individuals could face better employment prospects than less educated individuals and also have resources that make unemployment easier for them. Our analyses reveal no such gradient.

This study also finds that age moderates the health consequences of unemployment; unemployment affects the health of older workers, while younger workers seem to be unaffected. Although unemployment has risen more among younger than older workers, the health cost for the transitions have been more pronounced among older workers. Possible interventions to prevent and reduce the negative health effects of unemployment could therefore be most relevant for persons over 40 years. One explanation of the disproportionate large effect among older workers could be that unemployment in older age implies lower chances of reemployment (Skärlund et al., 2012; Wanberg et al., 2002). Another explanation could be that unemployment is a less socially stigmatizing among young people, since a majority of the unemployed are young, and young people tend more often than older

people to move in and out of employment.

Country-specific context could be another moderating factor; the longitudinal results vary between the 28 European countries (Fig. 1). Entering unemployment is associated with poorer subjective health in most, but not all, European countries. This finding also holds when controlling for the moderating factor of age; the results are not driven by cross-country variation in age composition of individuals entering unemployment.

3.1. Strengths

This study is unique in examining possible health consequences for those exposed to unemployment in Europe during the economic crisis. It follows 189,177 Europeans of working age, analysing their individual health changes over four years. Both the data and statistical methods used are powerful, and the specific job history file developed as part of this research makes it possible to explore issues of direct health selection and changes in health over a few years after the onset of unemployment.

A noteworthy advantage with this study is its two different ways of investigating health status before the unemployment spell: controlling for health *change* by applying health slopes and controlling for path dependency by controlling for previous health *levels*. Both methods are applied in order to reduce the possibility of bias due to various forms of health selection and support the main results: unemployment spells tend to have an immediate impact on self-rated health.

3.2. Limitations

EU-SILC provides a short observation window (from 2008 to 2011) and typically low number observations for each individual (mean = 2.14). Previous unemployment transition and other unfavourable life events prior to 2008 are not included in the analysis. By estimating the health slope prior to unemployment and applying a dynamic fixed effects model, we limit the bias due to effects of the most recent life events but cannot control for health selection in earlier work history. A larger time window could also allow for estimating more robust dynamic fixed effects models.

Attrition is a problem in longitudinal survey data and could affect our results. This study does not address the impact of such attrition biases.

We have limited information about factors that may mediate the relationship between unemployment and health such as social exclusion, health behaviour, psychological scarring, or psychological justification (Bambra, 2011; Bartley, 1994; Clark et al., 2001; McDonough and Amick, 2001). The SILC data allow for investigating the role of income and poverty including more subjective judgements such as economic stress. Income does not change any unemployment estimates in this research. However, we have not controlled for any subjective judgements of the financial situation because the dependent variable (subjective health) is also a subjective judgement. Psychological justification may mediate whether individuals who are unemployed project health as a reason for their loss or lack of work (McDonough and Amick, 2001). Such justifications are not necessarily intentional; they might as well be results of unconscious protection mechanisms, including a psychological defence against self-blame. If such a protection mechanism is prevalent, it would imply that the effects of unemployment on health are overestimated in all of the regression models presented here. On the other hand; some of the included time-variant confounders, such as partnership, could also be potential mediating factors (MacKinnon et al., 2007).

Although we find limited health consequences of unemployment, unemployment may affect health through more implicit mechanisms than direct exposure, and may affect the health of others in the lives of the unemployed. In a study of unemployment in Germany, Marcus (2013) showed that unemployment may affect mental health among family members, as mental health impairment among spouses was about two-thirds that of the directly affected unemployed workers. Furthermore, anticipation of job loss, a consequence of rising unemployment rates, may also affect the health of employed individuals. For example, Ferrie et al. (1998) found that rumours about the privatisation of public services led to deteriorated self-rated health among British civil servants in the two to three years before privatisation actually took place.

4. Conclusion

This study has investigated the individual health changes associated with unemployment transitions in Europe. Workers — especially older workers — who became unemployed during the Great Recession experienced a drop in self-rated health at the time of the transition. However, the potentially causal effect of unemployment on self-rated health appears to diminish after entering unemployment. The results indicate that workers in poor health face elevated risk of becoming unemployed. Taken together with the age-related differences in the probability of reemployment, this study supports the more general notion that poor health and disadvantageous social factors tend to accumulate.

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Study IV

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RESEARCH　　　　　　　　　　　　　　　　　　　　　　　　　**Open Access**

Health effects of unemployment in Europe (2008–2011): a longitudinal analysis of income and financial strain as mediating factors

Anne Grete Tøge

Abstract

Background: Unemployment has a number of negative consequences, such as decreased income and poor self-rated health. However, the relationships between unemployment, income, and health are not fully understood. Longitudinal studies have investigated the health effect of unemployment and income separately, but the mediating role of income remains to be scrutinized. Using longitudinal data and methods, this paper investigates whether the effect of unemployment on self-rated health (SRH) is mediated by income, financial strain and unemployment benefits.

Methods: The analyses use data from the longitudinal panel of European Union Statistics on Income and Living Conditions (EU-SILC) over the 4 years of 2008 to 2011. Individual fixed effects models are applied, estimating the longitudinal change in SRH as people move from employment to unemployment, and investigating whether this change is reduced after controlling for possible mediating mechanisms, absolute income change, relative income change, relative income rank, income deprivation, financial strain, and unemployment benefits.

Results: Becoming unemployed is associated with decreased SRH (−0.048, SE 0.012). This decrease is 19 % weaker (−0.039, SE 0.010) after controlling for change in financial strain. Absolute and relative changes in household equalized income, as well as changes in relative rank and transitions into income deprivation, are not found to be associated with change in SRH.

Conclusions: Financial strain is found to be a potential mediator of the individual health effect of unemployment, while neither absolute income, relative income, relative rank, income deprivation nor unemployment benefits are found to be mediators of this relationship.

Keywords: Unemployment, Self-rated health, Income, Financial strain, Europe, Recession, Fixed effects

Background

The number of unemployed in Europe has increased by more than 10 million since 2008 [1]. As unemployment reduces income for individuals and households [2, 3], and income is assumed to influence the subjective experience of unemployment [4], income changes caused by unemployment could in turn affect health [5, 6]. Reduced income could therefore be an underlying cause of

deteriorating health when people become unemployed. The aim of this paper is to contribute to the field by investigating whether and how income and financial strain mediated the health effects of unemployment during the 2008 recession in Europe.

Mechanisms

The idea that income mediates the health effects of unemployment relies on two assumptions: (1) that unemployment is accompanied by income reduction, and (2) that income reduction has negative health effects. Becoming unemployed entails a shift out of employment and a

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consequent loss of labour income. In Europe, welfare systems function as substantial buffers against the negative effect of unemployment on income [7, 8]. Nevertheless, the design and regulation of unemployment compensation systems result in some people being defined as eligible whilst others are not. Further, the net replacement rate varies between 13 % (in the United Kingdom) and 92 % (in Portugal), and the duration of the compensation varies between 20 weeks (in Lithuania) and 120 weeks (in Belgium) [7]. Whether unemployment affects income therefore depends on variations in both individual eligibility and national policies. These variations enable investigation of possible mediating health effects of reduced income.

More detrimental health effects of unemployment in people with greater income loss may be explained by different mechanisms [9, 10]. The *absolute income* hypothesis implies that income has a direct effect on health through reduced purchasing power [9, 10] for health-promoting items, services, and activities. However, it is often assumed that this relationship is non-linear: the more health-promoting items, services, and activities that are affordable for the individual or household, the less the additional benefit of affording more [10]. The *income deprivation* hypothesis is a variant of the absolute income hypothesis, but emphasizes the effect of moving below a critical income threshold. Income loss is expected to be harmful if, and only if, it leads to poverty. By acknowledging the role of social comparisons with significant others, the *relative income* hypothesis incorporates the psychosocial dimension of income inequality. Positions in a hierarchical society are seen in relation to both power and social status; being low on the chain of the income distribution can produce feelings of subordination, subservience, and being dominated, which can lead to stress, loss of control, and feelings of inferiority [9–16]. *Relative rank* is closely related to the concept of *relative income*, but implies a stronger emphasis on the psychosocial mechanism than does the relative income hypothesis [9, 10]. Here, health is assumed to be affected not only by the person's social position relative to a reference group, but also by their position on the scale of income distribution.

Empirical studies

A wide range of publications report correlations between health and unemployment and/or income. However, investigating whether income mediates the effect of unemployment on health requires investigation of health change within individuals. The research presented in this section is therefore restricted to studies with longitudinal designs.

Several studies suggest a causal relationship between unemployment and health, particularly mental health [19–22], but the effects vary between European countries (see [23] for country specific estimates). Similarly, income is usually found to be strongly correlated with health status [9]. The causal interpretations of such correlations could be that income affects health [24, 25], that health affects income [25], that income and health affect each other mutually, or that underlying factors cause both [26, 27]. Interpretations may also depend on the definition of "causal relationship" as well as the investigated sample [9]. For example, income may have a negative effect on health among children and most adults, but not in those over the age of 70 years [28].

Using structural equation models, income deprivation at the household level is found to predict forthcoming health problems [25]. Testing the inverse causal pathway shows the effects of health on household resources to be markedly lower than the other way around, supporting the hypothesis that income is an important determinant of health. Halleröd and Gustafsson [29] use similar models and report that changes in income are also related to changes in morbidity, but they are not able to determine the causal direction. Investigating how more severe income shocks affect health using dynamic panel models, Halliday [30] reports that income shock is on average associated with deteriorating SRH. Conversely, changes towards the middle of the income distribution are associated with increased SRH for those with both very high and very low income.

Very few studies have investigated how income and financial strain mediate the health effect of unemployment, but in a recent study Huijts, Reeves, McKee and Stuckler [31] address this exact question using the EU-SILC (2007–2009) and conclude that self-reported financial strain could explain about one third of the association between job loss and health. However, Huijts, et al. [31] do not investigate changes over time, but use a control for the baseline. These models are prone to omitted-variable bias due to baseline differences in working conditions, stress, or job insecurity, which are likely to affect the risk of unemployment, income change, and health. Such bias leads to overestimation of the health effects of unemployment and income change, and increases the risk of overestimating the mediating effect. This illustrates the need for longitudinal investigation.

Further, there are many reasons for income fluctuations, e.g. more/less working hours or getting a better/worse paid job. Such income changes should neither cause better nor worse health. When investigating how income mediates the effect of unemployment on health, one should therefore investigate the patterns among individuals who have experienced unemployment rather than the correlations in the general population.

Methods

Data

This analysis uses the 2008–2011 panel of European Union Statistics on Income and Living Conditions (EU-SILC), which covers 28 European countries (the EU-28 except for Germany and Ireland plus Norway and Iceland). The data are harmonized according to the European Parliament and Council regulation (1177/2003) and constitute an extraordinarily rich information source on employment.

Variables

The dependent variable is SRH, measured with the single item: How is your health in general? The responses are captured on a 5-point scale ranging from 1 (very bad) to 5 (very good). This measure is more sensitive to minor health changes than longstanding illness or chronic disease. A continuous measure of health provides more variation than a dichotomised measure of health, and linear regression models allow for more straightforward comparisons between countries and statistical models than non-linear regression of categorical outcome variables. Empirical research finds SRH a powerful predictor of future morbidity, mortality [32–34], and future health ratings from physicians [35, 36].

Unemployment is given the value 1 if a respondent's self-defined status is unemployed, and 0 if it is employed. All other statuses are coded as missing.

Absolute income is measured as log (income + 1), where income is the net sum (in thousands of €) of disposable household income, including welfare benefits and minus fixed costs (housing, utilities, debts, etc.), and adjusted for inflation (Harmonised Index of Consumer Prices [37]) and household size (OECD equivalence scale [38]). The equivalence scale assigns a value of 1 to the respondent, 0.5 to each additional adult member. and 0.3 to each child [39, 40]. *Income deprivation* is measured as a key measure of poverty in the EU list of indicators [41]. The "at-risk-of-poverty" threshold is set at 60 % of national median household income [42]. Living below this cut-off is coded 1 and above is coded 0. *Relative income* is measured as deviation between household absolute income and country/year median [10]. Income changes are therefore adjusted for changes in the overall income level in the national population. *Relative rank* is measured as the households' position within the national distribution of household absolute incomes [10]. This distribution is separated into deciles, where 1 denotes the 20 %with lowest income and 5 denotes the 20 % with highest income. The subjective dimension of the households' *economic difficulties* is measured on a 6-item scale of their ability to meet their needs, where 1 is very easy and 6 very difficult.

To investigate the independent mediating effect of unemployment benefits on SRH, net unemployment benefit is extracted from the absolute income and log (net unemployment benefit + 1) and log (absolute income – net unemployment benefit + 1) are included as independent variables. Gross unemployment benefit is used for countries where net unemployment benefits are unavailable (Denmark, Finland, Hungary, Iceland, Malta, Netherlands, Norway, Slovakia, and the United Kingdom).

Control variables

Age is controlled for using linear (years) and squared terms. Partnership status is controlled for using an indicator variable for married and cohabiting individuals (1) versus all other statuses (0).

Sample restrictions

EU-SILC is a 4-year rotational panel of national representative samples. However, in this study only people aged 19 to 65 with at least 2 years in the labour market (employed and/or unemployed) and at least one transition to unemployment are included. People from Croatia were observed only once (because Croatia joined EU-SILC in 2011) and are therefore excluded from the analysis. To avoid introducing reverse causality (i.e. the effect of health on income and unemployment), the sample is restricted to those with less than 3 months of absence or disability in the year prior to the transition to unemployment. Because household income depends on all household members, people who moved households in this period are also excluded from the analyses. The final sample includes 16 913 individual observations among 6 200 respondents.

Statistical analyses

Individual fixed effects models, i.e. models that control for time-invariant factors, are applied. This is a form of difference-in-difference design with a model that contrasts the health slope for those who experience unemployment with those who do not. Random models are not applicable, as the Hausman test showed statistical dependence between explanatory variables and the unobserved random term. In the fixed effects model individual change in SRH is a function of change in the explanatory variables. The basic model is

$$Y_{it} = \mu_t + \beta x_{it} + \nu_i + \varepsilon_{it} \text{ for } t = 1, ..., T \text{ and } i = 1, ..., N(0)$$

where y_{it} is the value of SRH for unit i at time t, μ_t is an intercept that may be different for each period, and βx_{it} is the value of the explanatory variable(s) for unit i at time t. As the models only use the within-individual variation, they control for unobserved factors that vary across units but are constant over time; ν_i. ε_{it} is the unobserved time variant factor (error term).

All the main mediating variables are included separately, since different measures of income are highly correlated

[10]. Combining them in one model would introduce multicollinearity [43].

Partnership status and number of dependent children are controlled for by equalizing disposable household income. To avoid multicollinearity, control for partnership status and children are only included in investigations of the impact of financial strain; reemployment is not included because this transition correlates with income change. All standard errors are clustered on countries. The analyses were conducted using Stata/MP 14.

Results

Table 1 reports summary statistics. Standard deviations are reported for individuals and show variation in individual change over time.

Income and SRH

In all European countries, transition from employment to unemployment implies lower income [7]. Except for income deprivation, this pattern can be rediscovered for all income and material factors included in this study (Appendix, Table 4). Table 2 reports individual fixed effects correlations, where SRH is a function of income and material factors. Models 1a and 2a show that increased *absolute* and *relative income* is associated with increased SRH. However, neither of these two estimates are significant. Model 3a investigates individual change in SRH as a function of change in *relative rank*, and shows that upward mobility in income distribution is associated with increased SRH, but this correlation is not

Table 1 Summary statistics

Variables	Mean	SD (within)	Min	Max	N
Dependent variable:					
Self-rated health (SRH)	3.90	0.43	1	5	16,913
Employment:					
Unemployment	0.41	0.47	0	1	16,913
Equalized disposable household income:					
Absolute income	2.23	0.25	−2.98	5.73	16,913
Income deprivation	>0.01	0.05	0	1	16,913
Relative income	−0.11	0.25	−5.82	3.12	16,913
Relative rank	2.69	0.63	1	5	16,913
Absolute income – excluding unemployment benefit	2.19	0.27	−2.98	5.73	16,913
Net unemployment benefit	0.33	0.44	0	5.12	16,913
Subjective perception of economy:					
Financial strain	4.44	0.60	1	6	16,913
Time variant covariates:					
Partnered	0.60	0.10	0	1	16,913
Age (in years)	39.29	0.87	19	59	16,913

statistically significant. Model 4a shows that moving into income deprivation (below 60 % of national median household income), is associated with a positive, but statistically insignificant change in SRH. Model 5a shows that increased financial strain is significantly correlated with deterioration in SRH: for each increase in the level of financial strain, SRH score drops by 0.044. By separating benefits from income, Model 6a investigates the effect of unemployment benefits beyond their effect on income. Results show that increased unemployment benefit is associated with a positive, but statistically insignificant increase in SRH.

Income mediation

The results in Table 2 show that only financial strain (Model 5a) affects SRH, implying that only financial strain can be expected to be a significant mediating effect between unemployment and SRH. Nevertheless, for transparency, Table 3 reports results for all models.

Model 0 reports a mean reduction in SRH of 0.048 when respondents become unemployed. Change in absolute income (Model 1b), relative income (Model 2b), relative rank (Model 3b), and income deprivation (Model 4b) does not substantially affect the unemployment coefficient; the mean reduction in SRH when respondents become unemployed is 0.047 (in models 1b, 2b and 3b) and 0.048 (in Model 4b). However, when controlling for financial strain (Model 5b), the unemployment coefficient is −0.039, in other words 19 % lower than the unemployment coefficient in Model 0. Nevertheless, a bootstrap estimation (50 replications) does not suggest that the unemployment estimate in Model 5b is significantly different from that in Model 0 (CI = −.019-037).

Model 6b investigates the mediating effect of unemployment benefits, but shows a minor *increase* in the unemployment coefficient, and can therefore not identify a mediating effect.

The results on Table 3 show a possible mediating effect of financial strain (Model 5b), however, it cannot be concluded that this mediating effect is different from zero. No mediating effects are detected from the remaining dimensions of income.

Sensitivity analyses

To test whether the results in Models 6a and 6b are robust to the inclusion of gross unemployment benefits, they are rerun on a sample restricted to individuals in countries where net unemployment benefits are available (see Appendix, Table 5). The main result persists: the mean change in SRH when respondents become unemployed does not decline when controlling for net unemployment benefit. If anything, there is rather a stronger effect of unemployment on SRH.

Table 2 Self-rated health (SRH): Individual fixed effects correlations. All models control for age and age squared

	Model 1a	Model 2a	Model 3a	Model 4a	Model 5a	Model 6a
	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects
Variables	SRH	SRH	SRH	SRH	SRH	SRH
Absolute income	0.006					
	(0.013					
Relative income		0.009				
		(0.013)				
Relative rank			0.003			
			(0.004)			
Income deprivation				0.010		
				(0.106)		
Financial strain					−.044***	
					(0.009)	
Absolute income – excluding unemployment benefit						0.005
						(0.014)
Unemployment benefit						0.013
						(0.011)
Control for partnership status:						
	NO	NO	NO	NO	YES	NO
Observations	16,913	16,913	16,913	16,913	16,913	16,912
R-squared (within)	0.009	0.009	0.009	0.009	0.013	0.009
Number of respondents	6,200	6,200	6,200	6,200	6,200	6,200

Standard errors clustered on countries in parentheses, ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$

Tøge & Blekesaune [23] found stronger effects of unemployment on SRH among older than younger workers. When limiting the analyses in the current study to individuals born before 1970, results confirm the main finding. Only financial strain reduces the unemployment estimate (Appendix, Table 6), however, bootstrap estimation suggests that the reduction is not statistically significant (CI = −.030–.055).

The number of respondents with unemployment transitions varies substantially across countries (see Fig. 1). Using fixed effects models, this variation implies that the results could be driven by effects in countries with high numbers of unemployment transitions.

Weighting for these differences, either by giving the countries even numbers of transitions (i.e. $\frac{1}{\text{Number of unemployment transitions}}$, see Appendix, Table 7) or by weighting according to the national increase in unemployment rates (i.e. $\frac{\Delta \text{ Non employment rate } (2008–2011)}{\text{Number of unemployment transitions}}$, see Appendix, Table 8) confirms the overall results. Differences between Model 0 and 5b in Appendix Tables 6 and 7 are not tested, as weights are not allowed with the bootstrap prefix in Stata/MP 14.

Discussion

This study provides a longitudinal investigation of income and financial strain as mediators of the health effect of unemployment in the first years after the global financial crisis hit Europe. The main results suggest that the effect of unemployment on SRH is more or less independent of change in income, but possibly somewhat mediated by self-perceived financial strain.

Huijts, et al. [31] investigated the potential mediating role of income and financial strain in the EU-SILC using a cross-sectional model that controls for initial health. This method provides estimates between cross-sectional and longitudinal estimates. In this case, a cross-sectional estimate is several times larger than a longitudinal estimate [23], indicating that the health gap between working and unemployed individuals is largely driven by health selection of individuals in poor health into unemployment and much less by changing health as people become unemployed. Longitudinal models that investigate changes in health in individuals remove all time-invariant sources of health selection into unemployment, and thus account for the fact that people in poor health are more likely to become unemployed than healthier individuals.

Table 3 Self-rated health (SRH): individual fixed effects correlations. All models control for age and age squared

Variables	Model 0 Fixed effects SRH	Model 1b Fixed effects SRH	Model 2b Fixed effects SRH	Model 3b Fixed effects SRH	Model 4b Fixed effects SRH	Model 5b Fixed effects SRH	Model 6b Fixed effects SRH
Unemployment	−0.048***	−0.048***	−0.048***	−0.048***	−0.048***	−0.039***	−0.050***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Absolute income		0.001					
		(0.014)					
Relative income			0.005				
			(0.014)				
Relative rank				0.002			
				(0.004)			
Income deprivation					0.016		
					(0.109)		
Financial strain						−0.041***	
						(0.009)	
Absolute income – excluding unemployment benefit							>0.001
							(0.014)
Unemployment benefit							0.017
							(0.011)
Control for partnership status:	YES	NO	NO	NO	NO	YES	NO
Observations	16,913	16,913	16,913	16,913	16,913	16,913	16,912
R-squared (within)	0.011	0.010	0.010	0.010	0.010	0.014	0.010
Number of respondents	6,200	6,200	6,200	6,200	6,200	6,200	6,200

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

The economic consequences of unemployment are influenced by the functioning of the welfare state, including the level and duration of benefits and the access to services during unemployment [4]. Despite variation across countries, European welfare states have performed considerably better than the United States (US) during this period [44]. Because income reductions in Europe are typically better ameliorated by benefits and services than in the US, the negative consequences of individual and family income loss

in Europe may be lower. This could mean that different forms of compensation, insurance, and benefits that have been provided throughout Europe have been quite effective in buffering the health effects of unemployment in this critical period. However, it is important to note that this study is based on a 4-year observational period. Even though psychological stress could be immediate [45] or even start before the job loss [46], the effects of actual income loss on the social determinants of health may take more than a few
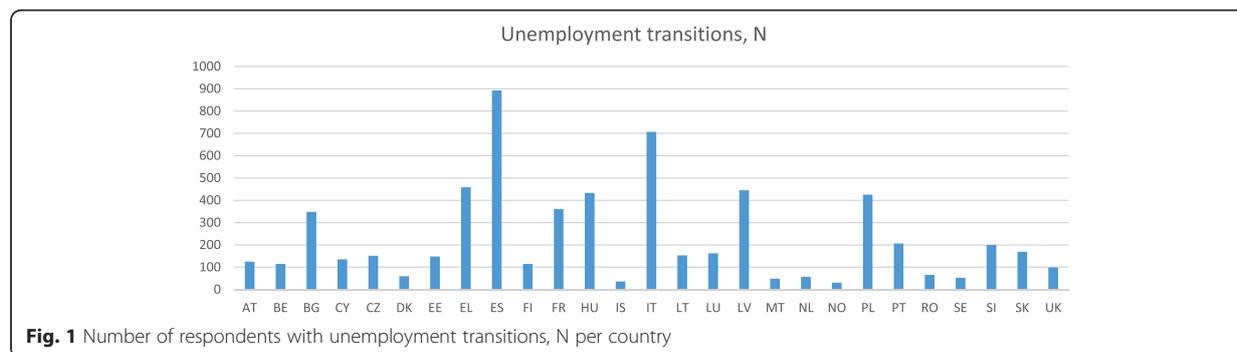

Fig. 1 Number of respondents with unemployment transitions, N per country

years to manifest [4]. Duration of unemployment and period of lower income may therefore be more important than actual income change at the time of transition to unemployment. Further, the panel does not include the years after 2011, when several countries introduced austerity measures. To the extent that such measures include cutbacks in benefits and services for the unemployed, income could become a stronger mediating factor.

The effect of unemployment on health could also depend on the time interval between unemployment transition and interview. When empirically tested, SRH tends to rise after the unemployment transition [23], indicating a gradually health improvement or adaptation to the new situation. However, the timing of interview should be independent of the timing of unemployment. As such, the coefficients indicate the change in SRH for a person with an average time interval between unemployment and interview.

Beyond including absolute income as a mediating factor, this study attempted to test other mechanisms by which income might mediate the health effect of unemployment: relative income, relative rank, and income deprivation. The results provide no evidence for any of these pathways. Disentangling the different income-related mechanisms is difficult, as the chain of events is complex [9, 47] and the operationalization of the various income measures does not necessary exclude alternative hypotheses [10]. Economic resources affect living conditions in absolute terms, but the extent to which material factors directly affect health is difficult to separate from indirect pathways through health behaviours, low control, insecurity, loss of self-esteem, and social isolation [18, 47]. "Usually the effects of chronic stress will be closely related to the many direct effects of material deprivation, simply because material insecurity is always worrying" [18]. Such psychological effects could be related to the various systems of compensation, insurance and benefits for the unemployed. Beyond buffering income reductions, unemployment protection might also contribute to a perception of safety and increase trust in the state as a provider of welfare and social security. Given that such emotions affect health, there could be an independent psychological effect of compensation on health and wellbeing; however, this study finds no evidence for this mechanism as a mediating effect of unemployment on health.

Subjective assessments of one's financial situation may shed light on another psychosocial pathway: self-perceived economic stress [11, 17], a dimension that is not necessarily captured by objective measures of income change [21]. When measuring peoples' abilities to subsist on their current income, it is necessary to have their subjective judgement of their present financial situation. This judgement, however, relates to their perceived future economic prospects [48]. Even in a household with a stable income and ability to maintain its normal standard of living, risk

of upcoming change in income may affect a person's consumption and judgement of their current financial situation. In line with Huijts, et al. [31], the present results indicate that financial strain could mediate the effect of unemployment on health; the estimated size of this mediating effect is 19 %, i.e. about half of what Huijts, et al. [31] suggest. Nevertheless, the mediating effect of financial strain is not statistically significantly different from zero. It should also be mentioned that these 19 % are estimated without considering possible endogeneity: with self-reported measurements on both sides of the equation, there is the risk that time-variant psychological processes may influence both the dependent and independent variables. An underlying variable, e.g. mood, could affect both subjective economy and SRH. This means that the "true" mediating effect of financial strain in the European population during the financial crisis (2008–2011) would be somewhere below 19 %.

Contrary to Huijts, et al. [31], this study finds no mediating effect of unemployment benefits. This result does not necessarily mean that health is unaffected by such schemes; it could rather illustrate the difficulty of identifying such effects. By grouping all income sources into one pot, it is possible to examine the health effects of income changes. This pooling of income relies on the assumption that unemployment with low (or no) compensation would give a steeper decline in overall household income than unemployment with compensation. However, lack of compensation for one household member could be an incentive for higher work intensity among other others, and consequently generate a higher overall household income. When one person becomes unemployed, other household members can be a substantial buffer against income reductions. Isolating the effect of unemployment benefits may therefore be difficult; increased unemployment benefits at the household level could simply imply that more members are unemployed.

Strengths and limitations

All analyses are longitudinal estimates drawn from the EU-SILC panel, which includes data on income and living conditions for almost 17,000 Europeans who experienced a transition to unemployment in the years 2008 to 2011. If the health effects of unemployment are mediated by income, evidence should be findable in these data.

It is important to note that SRH is a crude measurement of health. Unemployment transition could have diverging effects on mental and physical health [49–52]. Although SRH might be more sensitive to mental health than more specific measures of illness or health conditions, it is not possible to separate these effects. More

fine-grained health measures are preferable, but unfortunately not available in the EU-SILC.

Whether income mediates the effect of unemployment on health could depend on the position within the labour market. However, such analyses are not possible due to limited information in the EU-SILC.

Attrition is a problem in longitudinal survey data and could affect the results. The rotational design of EU-SILC does not provide necessary information to address the impact of attrition biases. Emigrating respondents are followed until they emigrate, but not after. If emigration is more prevalent among people who experience stronger (or weaker) health effects of reduced income following unemployment, emigration will bias the estimates.

Conclusion

Changes in both absolute and relative income, as well as in self-reported financial strain, are significantly related to changes in SRH; however, only financial strain is found to be a potential mediator of the individual health effect of unemployment.

Appendix

Table 4 Income and material factors as functions of unemployment. All models control for age and age squared

	Model A	Model B	Model C	Model D	Model E	Model F	Model G
	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects
Variables	Absolute income	Relative income	Relative rank	Income deprivation	Financial strain	Absolute income – excl. unemp. benefit	Unemployment benefit
Unemployment	−0.055*	−0.040*	−0.061*	−0.002	−0.217***	−0.070***	0.138***
	(0.013)	(0.013)	(0.027)	(0.001)	(0.020)	(0.015)	(0.029)
Control for partnership status:	NO	NO	NO	NO	NO	YES	NO
Observations	16,913	16,913	16,913	16,913	16,913	16,913	16,912
R-squared (within)	0.016	0.018	0.015	0.015	0.002	0.049	0.108
Number of respondents	6,200	6,200	6,200	6,200	6,200	6,200	6,200

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 5 Sensitivity test, restricted to individuals in countries where net unemployment benefit is available. All models control for age and age squared

	Model 0	Model 6a	Model 6b
	Fixed effects	Fixed effects	Fixed effects
Variables	SRH	SRH	SRH
Unemployment	−0.056***		−0.059***
	(0.011)		(0.010)
Absolute income – excluding unemployment benefit		−0.006	−0.011
		(0.011)	(0.012)
Unemployment benefit		0.014	0.018
		(0.012)	(0.02)
Control for partnership status:			
	YES	NO	NO
Observations	14,083	14,083	14,083
R-squared (within)	0.009	0.007	0.009
Number of respondents	5,151	5,151	5,151

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 6 Sensitivity test. Restricted to respondents born before 1970

	Model 0	Model 1b	Model 2b	Model 3b	Model 4b	Model 5b	Model 6b
	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects	Fixed effects
Variables	SRH	SRH	SRH	SRH	SRH	SRH	SRH
Unemployment	−0.074*	−0.073*	−0.074*	−0.074*	−0.074*	−0.061*	−0.075*
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.015)	(0.015)
Absolute income		0.004					
		(0.023)					
Relative income			−0.004				
			(0.025)				
Relative rank				0.004			
				(0.008)			
Income deprivation					0.113		
					(0.162)		
Financial strain						−0.053***	
						(0.009)	
Absolute income – excluding unemployment benefit							0.003
							(0.021)
Unemployment benefit							0.005
							(0.013)
Control for partnership status:							
	YES	NO	NO	NO	NO	YES	NO
Observations	8,249	8,249	8,249	8,249	8,249	8,249	8,249
R-squared (within)	0.016	0.016	0.016	0.017	0.017	0.022	0.016
Number of respondents	2,966	2,966	2,966	2,966	2,966	2,966	2,966

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 7 Sensitivity test. Weighted for uneven numbers of unemployment transitions. All models control for age and age squared

	Model 0 Fixed effects	Model 1b Fixed effects	Model 2b Fixed effects	Model 3b Fixed effects	Model 4b Fixed effects	Model 5b Fixed effects	Model 6b Fixed effects
Variables	SRH	SRH	SRH	SRH	SRH	SRH	SRH
Unemployment	−0.044**	−0.042	−0.043	−0.043**	−0.044**	−0.027	−0.044*
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.021)
		0.020					
		(0.035)					
Relative income			0.017				
			(0.033)				
Relative rank				0.003			
				(0.007)			
Income deprivation					0.131		
					(0.166)		
Financial strain						−0.059***	
						(0.014)	
Absolute income – excl. unemployment benefit							0.015
							(0.034)
Unemployment benefit							0.010
							(0.015)
Control for partnership status:							
	YES	NO	NO	NO	NO	YES	NO
Observations	16,913	16,913	16,913	16,913	16,913	16,913	16,912
R-squared (within)	0.009	0.009	0.009	0.009	0.009	0.013	0.009
Number of respondents	6,200	6,200	6,200	6,200	6,200	6,200	6,200

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 8 Sensitivity test. Weighted for uneven numbers of Unemployment s and change in unemployment rate (2008–2011). All models control for age and age squared

	Model 0 Fixed effects	Model 1b Fixed effects	Model 2b Fixed effects	Model 3b Fixed effects	Model 4b Fixed effects	Model 5b Fixed effects	Model 6b Fixed effects
Variables	SRH	SRH	SRH	SRH	SRH	SRH	SRH
Unemployment	−0.041*	−0.040	−0.040	−0.041*	−0.041*	−0.026	−0.042*
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)	(0.020)
Absolute income		0.025					
		(0.038)					
Relative income			0.022				
			(0.035)				
Relative rank				0.004			
				(0.007)			
Income deprivation					0.126		
					(0.161)		
Financial strain						−0.057***	
						(0.013)	
Absolute income – excluding unemployment benefit							0.021
							(0.037)
Unemployment benefit							0.012
							(0.016)
Control for partnership status:							
	YES	NO	NO	NO	NO	YES	NO
Observations	16,913	16,913	16,913	16,913	16,913	16,913	16,912
R-squared (within)	0.009	0.010	0.010	0.009	0.009	0.017	0.010
Number of respondents	6,200	6,200	6,200	6,200	6,200	6,200	6,200

Standard errors clustered on countries in parentheses, *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

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