

# **The buffering role of the family in the relationship between job loss and self-perceived health: longitudinal results from Europe, 2004-2011.**

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## **ABSTRACT**

Unemployment has numerous negative consequences for health, but the family and the welfare state can mitigate these consequences. How the family supports its members and whether and to what extent this interacts with the broader context is still an open question. Our evidence show that job loss is causally linked to significant declines in health for men, but not for women. Yet, the increased risk of poor health is lower for coupled men, especially if the partner is employed. This suggests that both emotional and economic support play a role. Moreover, the family's mitigating role widely varies across different welfare regimes in Europe and it is particularly strong in Southern and Eastern regimes, characterized by "rudimentary" welfare systems and a more traditional family model.

**Keywords:** Self-Rated Health, Social inequality, Unemployment, Social Support, Longitudinal analysis

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## INTRODUCTION

The family's role in buffering the negative effects of unemployment on health is well established in the literature (Gore 1978; Pearlin et al. 1981; Milner et al. 2016). However, despite the number of studies on this subject, it is less clear *how* the family absorbs the health consequences of job loss. While the family is generally considered both a source of emotional and economic support for its members (Ross, Mirowsky, and Goldsteen 1990; Umberson, Crosnoe, and Reczek 2010), studies have generally focused on only one or the other dimension, and very few have adopted a dynamic perspective (Milner et al. 2016). After examining the causal relationship between job loss and self-perceived health, the first contribution of this study is to investigate the moderating role of the family, and to disentangle the economic from the emotional and social support provided by one partner when the other loses their job.

As well as the family, the welfare state is an important institution in providing a safety net against labour market risks (Esping-Andersen 1999). Moreover, the consequences of unemployment for health tend to vary substantially across welfare states (Bambra and Eikemo 2009). However, previous studies have neglected to investigate whether the buffering role of the family varies across different welfare states regimes. Thus, our second contribution is to examine how different types of families, in terms of composition and labour market attachment, may interact with different sets of institutional arrangements in shaping the relationship between job-loss and self-perceived health. We apply fixed-effects models to investigate within-person changes in self-perceived health for European men and women, comparing the role of social and economic family's support when a person transits from employment to unemployment.

## **Job loss and Health**

Unemployment is one of the major contemporary risks for individuals' and families' health (WHO 2009; CSDH 2011). The relationship is consistent across countries and holds for different measures of health (Bambra and Eikemo 2009; Catalano et al. 2011). It has long been established that employed people fare better than those who are unemployed (Marmot et al. 1991; Steele, French, and Bartley 2013; Riumallo-Herl et al. 2014). The mechanisms are straightforward. Unemployment may lead to financial strain, material deprivation, and poverty, strongly affecting individuals' and families' private lives, including health (Tøge 2016). Moreover, job loss is an acute stress factor that affects personal coping resources and psychological balance, tracing the path for serious mental diseases (Jahoda 1982). Unemployment may also induce substance abuse and other unhealthy behavioural changes (Golden and Perreira 2015). Finally, labour-related inequalities in health may be the result of an opposite process known as "health selection" by which individuals with poor health are selected into unemployment at a higher degree, and have less probability of re-employment than their healthier counterparts (Korpi 2001; Flint et al. 2013).

## **The role of the family**

Some people are able to cope with job loss better than others. In addition to the well-known positive, direct effect on health (Milner et al. 2016; Wood, Goesling, and Avellar 2007), the family's support plays a fundamental role in buffering the detrimental consequences of stressful events, such as unemployment, on health (Gore 1978; Pearlin et al. 1981; Milner et al. 2016). Most studies have focused on social support, underlining the beneficial effect of emotional help provided by intimates (familiar and friends) on mental and physical health (Gore 1978; Pearlin et al. 1981; Milner et al. 2016). However, recent research underlines that

while social support improves the health of unemployed people, it does not completely eliminate the negative health effects of unemployment. (Milner et al. 2016).

Moreover, partners can offer not only emotional support, but also material and tangible support (Ross, Mirowsky, and Goldsteen 1990). Having an employed partner may increase economic well-being by providing additional income sources and by generating economies of scale within the household (Hahn 1993; Becker 1981; DiPrete 2002). By stabilizing the couple's financial situation, economic resources provided by one partner can compensate for the negative health consequences of financial stress (Peirce et al. 1996). Thus, while single people are particularly vulnerable to the economic consequences of job-loss, being in a relationship means being better sheltered against this risk especially when there is more than one earner in the couple.

Although there is an abundance of literature, no previous research has sought to understand to what extent the two dimensions of family's support – social or economic – may come together to protect the health of the jobless. Thus, by disentangling the two main health benefits of the family, and in particular of partnership as a fundamental aspect of the broader family situation, this paper aims to go beyond the current state of research. Indeed, it is reasonable to think that when an individual loses their job the partner may be more able to compensate better for the health losses if s/he can provide also financial resources, rather than emotional support only. Since the economic buffering capacity of the family is generally determined by the labour market participation of the partner (DiPrete 2002), we regard the partner's employment condition as a measure that reflects both the family structure and its financial potential. As a direct measure of emotional support is not available in the data we use, we assume that a beneficial effect of the presence of a non-working partner would be due to emotional support. It is indeed largely accepted that (stable) partnership relations are characterized by the special qualities of "trust and intimacy", which are the pillars of emotional support (Pearlin et al. 1981).

Given the previous considerations, our first two hypotheses are: Hp1) *the transition into unemployment has a negative causal effect on individuals' health status*; Hp2) *compared to single people, the effect of job loss on health is less negative for those who have a partner, especially in the case of working partner. These hypotheses should hold for both men and women.*

### **The family and welfare state regimes**

Unemployment is less problematic for individual and population health if there is a welfare state able to cushion some of the negative consequences (Esping-Andersen 1999; Bambra and Eikemo 2009; Norström and Grönqvist 2015; Esping-Andersen 1990). High levels of generosity, coverage and effectiveness of welfare provisions benefit the society as a whole and not just those that receive the benefits (Sjöberg 2010). Moreover, extensive unemployment insurance programmes may reduce transitions into ill-health at the country-level and mitigate the socio-economic gradient in health (Ferrarini, Nelson, and Sjöberg 2014). Welfare provisions (e.g. unemployment insurance and social security transfers) are particularly important for the wellbeing of individuals and families that have to deal with adverse life events, including unemployment. It has been found that there exists a consistent relationship between unemployment and self-reported health across Europe. This relationship, however, varies considerably across welfare regimes (Bambra and Eikemo 2009). Therefore, it seems that some welfare states are more effective than others in reducing dependence on the market, and assuring acceptable living standards.

Generally, the relatively generous and universal welfare provisions of the Scandinavian countries enhance population health (Norström and Grönqvist 2015; Chung and Muntaner 2007; Eikemo et al. 2008). Nevertheless, recent studies document that Scandinavian countries are failing to outperform other Western countries in reducing socio-economic inequalities in health (Bambra and Eikemo 2009; Eikemo et al. 2008b; Eikemo et al. 2008c). In particular,

Southern and Eastern countries are characterized by the smallest relative health inequalities between employed and unemployed people (Bambra and Eikemo 2009). A possible explanation of this sort of “puzzle” may be found in the role of the family. Indeed, “the more traditional family model in these countries means that additional material, and non-material, support is provided by the family to unemployed members, thus buffering the impact of unemployment on health”, as suggested by Bambra and Eikemo (2009, p, 97). Nevertheless, empirical tests on this point are still lacking.

Although many studies have investigated the role of the family or welfare provisions in shaping labour-related health inequalities, little is known about how and to what extent they interact to mitigate the negative consequences of job loss on self-perceived health. The literature on welfare regimes underlines that great variation exists across countries in the way social risks are addressed and in how the responsibilities of social protection are divided between the state, the market, and the family (Esping-Andersen 1990; 1999). Thus, welfare relies to different extents on the family, and states are not equally effective in sheltering their citizens from risks. For example, Southern European countries are characterized by a “rudimentary” welfare state, and social risks are mostly borne by the family. The redistribution and pooling together of financial resources at the family level is a fundamental source of welfare in these countries (Eikemo and Bambra 2008; Ferrera 1996). In these countries, there is extensive need for individuals to rely on support and solidarity from their families to cope with social risks (Esping-Andersen 1999; Eikemo and Bambra 2008; Ferrera 1996). Thus, we expect to find a large variation in the family’s buffering role across welfare regimes, and more precisely (Hp3) *a significant buffering effect of the partner – especially the working partner – in more familialistic and sub-protective welfare state regimes, whereas in the other states, effects should be smaller or even absent.*

## **METHODS**

### **Data**

The empirical analysis is based on the European Union Statistics on Income and Living Condition (EU-SILC) provided by Eurostat for the years 2004 to 2011, which has the advantage of providing internationally comparative data for many European countries (we use 24). We restrict the sample to men and women aged between 35 and 55 years old, since this age range represents a life stage in which individuals have typically already formed a family and entered the labour market. We further exclude from the analysis people who were permanently sick and disabled, retired, doing community or military service, or out of the labour market for family reasons. The analytical sample contains 270,385 respondents: 139,432 men and 130,953 women. It is an unbalanced sample and respondents are observed for 2 years on average.

Our outcome variable is self-perceived (*bad*) health (*SPH*), which has been shown to be a valid and powerful predictor of mortality, and a reliable measure for comparison across socio economic status (Idler and Benyamini 1997; Idler and Kasl 1995; Burström and Fredlund 2001). Moreover, self-perceived health is a general measure able to capture several dimensions of health, both physical and mental (Knäuper and Turner 2003). In EU-SILC, it is surveyed with the question “How is your health in general; would you say it is... very good, good, fair, bad, very bad”. In line with the literature, the five-point scale is recoded as a binary variable, collapsing “very good” and “good” to 0, and “fair”, “bad” and “very bad” to 1 (Bambra and Eikemo 2009; Ferrarini, Nelson, and Sjöberg 2014).

Job loss is defined as moving from employment to unemployment, indicating that a person has experienced at least one transition within the observation window. It is coded 1 if the respondent is observed to be unemployed at the time of the interview, conditional on being

employed in one of the previous interviews. Job loss might include persons who become unemployed for reasons other than involuntary job loss. However, restricting the sample in age (35-55) and to the active population, allows us to exclude people who have not yet entered (i.e. school leavers) or have transitioned out the labour market (i.e. early retired), and limits possible bias due to this imprecision.

We investigate the buffering effect of living with a partner as a proxy for the broader family situation. Family situation is initially measured via a (time-constant) dummy variable coded 0 if the observed person is single, and 1 if s/he has a spouse or a cohabiting partner (Tøge and Blekesaune 2015). Furthermore, we distinguish family situation taking into account the partner's employment status: living with a working partner, living with a non-working partner (unemployed or out of the labour force), and the absence of a partner.

Following the epidemiological literature, 24 European countries are clustered in five Welfare Regimes: Conservative (Austria, Belgium, France, Luxembourg, the Netherlands), Southern (Cyprus, Spain, Greece, Italy, Portugal, Malta), Social Democratic (Denmark, Finland, Norway, Iceland, Sweden); Liberal (Ireland, United Kingdom) and Eastern (Czech Republic, Estonia, Hungary, Poland, Slovakia, and Slovenia) (Ferrera 1996; Bambra 2007).

## **Analysis**

The probability of experiencing "bad health" following a transition to unemployment is estimated by applying linear probability models which control for household disposable income, age (centred) and age squared (centred), and presence of children under 16 years old. We undertake separate analyses for men and women. While the literature suggests that consequences of unemployment on health may follow similar patterns for men and women (Tøge and Blekesaune 2015; Catalano et al. 2011), studies have shown that men and women respond differently to diverse dimensions of support provided by the partner. In terms of



health, women seem to be more sensitive to economic support, whereas men seem to benefit more from emotional support and the preventing-control provided by the partner (Gove 1972; Umberson 1992; Hahn 1993). In addition, gender differences may emerge when both the family and the welfare state are taken into account (Strandh et al. 2013). A detailed investigation of gender differences in the consequences of unemployment on health is beyond the scope of this paper, but it is nonetheless important to take into account the possible heterogeneity in this respect between men and women.

As mentioned, we perform the analyses using linear probability models (LPM). Whether the use of LPM is appropriate when the dependent variable is dichotomous is a highly debated issue in the literature. While it is true that LPMs can lead to biased estimates in certain situations, it has been shown that in most of the cases estimates are reliable, and the violation of assumptions may be of little practical importance (Hellevik 2009). In this paper, we employ LPMs because of the straightforward interpretation of coefficients, and because they allow for comparison of estimates across different models (Mood 2010). However, we reproduced our analysis using logit models and computed average marginal effects. Results of these checks are in line with our results based on LPMs (see Table 4A and Table 5A in the Appendix).

### **Health selection and the identification of causality**

Causal claims are challenges for social scientists, and a fundamental issue to address in health research (Stowasser, Heiss, and McFadden 2012). A lack of causal evidence may lead to inaction or inappropriate policies to address health-damaging risks. Considering the contributions of health selection is an important step for assessing the causality nexus in the relationship between employment transitions and health.

In this study, we rely on the counterfactual definition of causality (Rubin 1974) that defines the causal effect as the difference between what we actually observe in the case of treatment and

what we would have observed in the case of no-treatment (King, Keohane, and Verba 1994). While the idea behind this definition is the experiment, a counterfactual causal effect can be identified also in a non-experimental setting, once health selection is addressed.

The health selection issue is threefold. First, there is the simultaneity problem (Stowasser, Heiss, and McFadden 2012): when measured at the same time point, employment may have a causal influence on health, as well as health status may have a causal influence on employment. The second issue is the omitted-variable bias (Stowasser, Heiss, and McFadden 2012): a number of unmeasured individual characteristics may confound the relationship between current employment and health. For example, cognitive abilities play a decisive role for employment outcomes, and may also have indirect consequences for general health. Finally, among these personal characteristics, early health status may also affect both health and the likelihood of unemployment. The current health status might be the result of previous negative or positive trends in health, i.e. the result of “state dependence” processes that characterise health dynamics. Put simply, health statuses tend to be associated over time (Sarti and Zella 2016; Blackwell, Hayward, and Crimmins 2001). A common strategy to solve this issue is to include a measure of early life, or previous health status in the model (Tøge and Blekesaune 2015).

This paper firstly addresses health selection by applying fixed-effects models, which control for unobserved (and observed) time-invariant heterogeneity. These allow us to estimate the relationship between a change over time in the exposure variable and a change in the outcome variable, using the within-individual variation (Halaby 2004). Secondly, we address “state dependence” mechanisms via the inclusion in the model of a measure of health at  $t-1$  (Halaby 2004). Specifically, we do this by applying a dynamic Arellano-Bond (AB) model (table 1), a Generalized Method of Moments that controls for true state dependence, instrumenting lagged dependent variables as covariates (Halaby 2004).

However, it has to be noted that while the AB model provides more robust estimates because it better controls for possible health selection, the inclusion of information on health at t-1 has the drawback of strongly reducing the number of observations. Hence, in our analytical strategy, we decided to apply static fixed-effects estimators in the other sets of models (table 2 and 3).

## **RESULTS**

Table 1 reports changes in probabilities of experiencing bad health at the time of job loss (descriptive analyses are reported in Table 1A and 2A in the Appendix). Data are pooled by country. Moving from Model 1 (between estimator) to Model 1c (Arellano-Bond), the effect of the transition to unemployment on health decreases in size, being better adjusted for selection. In Model 1 (between effects LPM), our independent variable job loss is used to explain the between individuals variation of self-perceived health. Results reveal that both unemployed men (+0.13\*\*\*) and unemployed women (+0.12\*\*\*) have higher probabilities of experiencing poorer health than their employed counterparts. However, this model may be contaminated by direct and indirect health selection.

Fixed-effects models address these problems. Model 1a implements static fixed-effects estimators that control for unobserved time-constant individual characteristics (indirect selection) that are associated with both unemployment and self-perceived health (e.g. ability, education level, conditions in early life, genetic disposition). As expected, the size of the coefficients for both men and women are strongly reduced when unobserved third factors are controlled for (Model 1a). Entering unemployment leads to an increase of 3 percentage points in the probability of experiencing a negative change in perceived health for men, and an increase of 2 percentage points for women. Although part of the association between

unemployment and health is explained by indirect selection, the health consequences of job loss persist. The relationship holds even when time-varying covariates are included in the Model 1b. Although small in magnitude, these figures have nonetheless a substantial impact on health, considering the incidence of bad health among 20 and 23 per cent of men and women respectively (see table 1A in the Appendix).

Indirect health selection is further addressed in Model 1c. As this model shows, prior health status exerts a sizeable effect on current health status for both men (+0.09<sup>\*\*\*</sup>) and women (+0.10<sup>\*\*\*</sup>), revealing the path dependence mechanism of health selection. Moreover, results suggest that causation and selection work differently for men and women. Indeed, when in the last model direct and indirect selection are cleaned out, the causal relationship between entering unemployment and self-perceived health persists for men (+0.03<sup>\*\*\*</sup>), whereas for women the effect decreases and becomes non-significant (+0.01). Health selection therefore seems to play a larger role for women than for men in explaining the relationship between job loss and self-perceived health. This result is in line with other studies that have found health differences between the employed and the unemployed being bigger among women than men (Bambra and Eikemo 2009). These socio-economic inequalities in health could indeed be explained by the fact that ill-health selects women into unemployment to a greater extent than men (Bambra and Eikemo 2009). Relying on the more robust estimates provided by the AB specification, we conclude that a causal effect of job loss on health exists for men.

**Table 1**

Self-perceived health as result of job loss and covariates

	Model 1		Model 1a		Model 1b		Model 1c	
	BE (unadjusted)		FE (unadjusted)		FE (adjusted)		AB	
	Men	Women	Men	Women	Men	Women	Men	Women
Job loss	0.13***	0.12***	0.04***	0.02**	0.03***	0.02**	0.03***	0.01
Income (ln)					-0.01***	-0.00	-0.01*	-0.00
Age					0.00***	0.00***	0.00***	0.00**
Age squared					0.00**	0.00**	0.00**	0.00**
Child < 16 y.o.					0.01	-0.01	0.01	-0.01
Health at t-1							0.09***	0.10***
Constant	0.20***	0.23***	0.19***	0.23***	0.28***	0.27***	0.22***	0.21***
R <sup>2</sup>	0.04	0.05						
R <sup>2</sup> (FE within)			0.0004	0.0001	0.001	0.0005		
N observations	287,172	264,016	287,172	264,016	287,172	264,016	138,413	121,029
N individuals	139,432	130,953	139,432	130,953	139,432	130,953	82,861	73,433

Legend: \*p&lt;.05; \*\* p&lt;.01; \*\*\* p&lt;.001.

Adjusted for Robust Standard Errors

Test for Zero Autocorrelation for the AB model

The next step is to investigate the role of the family as a source of social and economic support in buffering the adverse health consequences of becoming unemployed. While the estimates of the static (FE) and dynamic (AB) models in Table 1 differ at least for women, results for these two models are equivalent for both sexes once we include the family status variable<sup>1</sup>. However, as previously mentioned, the AB model provides more robust estimates in terms of causality at the expense of the number of observations. Because of this, we preferred to use the FE specification throughout the rest of the analyses.

Table 2 reports estimates of two static fixed-effects models with interaction terms between job loss and the two variables for partner presence and partner's economic status. Model 2a shows that the presence of a spouse or cohabiting partner in the household mitigates the negative

<sup>1</sup> Checks show similar results for model 2a and model 2b by using either static or dynamic estimators (ask the authors for results).

effect of job loss for men. When transiting to unemployment, the probability of experiencing bad health increases by 5 percentage points (+0.05\*\*\*) for single men, but by only 2 percentage points (0.05 - 0.03) for partnered men. The interaction effects for women are radically different. Single women seem not to suffer from job loss, and the presence of a partner at the time of transition increases their risk of perceiving themselves as in poor health conditions (+0.02). Results for women are, however, not statistically significant.

**Table 2**

Self-perceived bad health. Interaction between job loss and partner (time-constant)

	Model 2a		Model 2b	
	Men	Women	Men	Women
Job loss	0.05***	0.00	0.05***	0.01
Job loss#With Partner	-0.03*	0.02		
Job loss#No-working Partner			-0.02	0.02
Job loss#Working Partner			-0.04**	0.01
Income(ln)	-0.01***	-0.00	-0.01***	-0.00
Age	0.01***	0.00***	0.01***	0.00***
Age squared	0.00**	0.00**	0.00**	0.00**
Child <16 y.o.	0.01	-0.01	0.01	-0.01
Constant	0.28***	0.27***	0.28***	0.27***
R2 (FE within)	0.001	0.0006	0.001	0.0006
N observations	287,172	264,016	287,172	264,016
N individuals	139,432	130,953	139,432	130,953

Legend: \*p<.05; \*\* p<.01; \*\*\* p<.001  
Adjusted for Robust Standard Errors

Model 2b distinguishes the partner's employment status with a view to understanding the extent to which the buffering effect of a partner comes from the partner's economic support rather than from its emotional support. For men, having a non-working partner (either unemployed or inactive) when becoming unemployed reduces by 2 percentage points the probability of experiencing poor health. A working female partner, instead, nullifies the detrimental consequences of unemployment (0.05 - 0.04) and thus strongly shelters men. This

is true even when controlling for the overall economic situation of the family at any given point in time. The interaction coefficient between job loss and partner's employment status is statistically significant (-0.04\*\*).

The risk of poor health after job-loss seems to be less strong for a single woman (+0.01) than for a single man (+0.05\*\*\*), but for women with a partner the risk slightly increases. No matter what the male partner's working status is, for women the presence of a partner does not ameliorate the harmful consequences of losing the job. However, even in this model, coefficients for women are not statistically significant.

Overall, the analysis confirmed our first and the second hypotheses for men. Entering unemployment causes a negative change in self-perceived health among men, but being in a relationship buffers the impact. Moreover, this protective effect is more effective when the female partner can ensure financial stability for the family by providing a second revenue.

### **Family and Welfare State**

The role of the family in moderating the consequences of unemployment is likely to vary with the broader welfare context (Hp.3). In Table 3, this is investigated separately for the five welfare state clusters by estimating Model 2b from table 2, thus interacting job loss with the partner's working status.

Our results confirm that the consequences of job loss on health depend on the broader welfare context. The results support the idea that the family plays a fundamental role in welfare provision in Southern and Eastern European countries, especially for men. The negative consequences of job loss are cushioned by the presence of a non-working partner (0.08-0.05) and almost completely absorbed by the presence of a working partner (0.08-0.07) in the Southern regime. Moreover, having an employed female partner even reverses the sign of the effect of job loss for Eastern European men (0.04-0.06). In Conservative and Liberal countries,

job loss is associated with an increase in the probability of experiencing bad self-perceived health for single men, as is the case in Southern countries. However, family has no impact in Liberal, nor in Conservative welfare states, where the coefficients for the interaction terms are not statistically significant.



**Table 3**

Self-perceived bad health as result of job loss and the presence of partner across welfare regimes.

	Conservative		Nordic		Southern		Liberal		Eastern	
	M	W	M	W	M	W	M	W	M	W
Job Loss	0.06*	0.00	-0.00	-0.02	0.08***	-0.01	0.09*	0.09+	0.04	0.03
Job loss # With No working Partner	0.00	0.02	0.01	0.02	-0.05*	0.06+	-0.06	-0.04	-0.01	-0.03
Job loss # With working Partner	-0.02	0.01	0.01	0.03	-0.07**	0.03	-0.03	-0.07	-0.06*	0.01
Income(ln)	-0.01	-0.01	-0.01	-0.00	-0.01*	-0.00	0.01	-0.01	-0.01	-0.00
Age	0.01***	0.01***	0.00	0.00	0.00	0.00	0.01***	-0.00	-0.00	-0.00
Age squared	0.00	0.00	0.00	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00*
Child <16 y.o.	-0.00	-0.00	0.02	0.00	-0.00	-0.01	0.00	-0.03	0.02	-0.01
Constant	0.28***	-0.25***	0.24***	0.15	0.28***	0.24***	0.09	0.26**	0.33***	0.34***
R2 (FE within)	0.005	0.004	0.0003	0.0001	0.001	0.0004	0.005	0.001	0.0006	0.0004
N observations	61,950	55,137	37,314	34,819	101,216	84,606	19,371	19,242	67,321	70,212
N individuals	25,602	23,354	18,146	17,274	51,161	44,333	10,971	11,001	33,552	34,991

Legend: (+p<.01); \*p<.05; \*\* p<.01; \*\*\*p<.001  
Adjusted for Robust Standard Errors

## CONCLUSIONS

This study provided new insights into the importance of the family in compensating for the negative effect of job loss on self-perceived health. In addition, it showed that family support works through different channels and varies across welfare state regimes in Europe. Previous research has highlighted that some people cope better than others with adverse life circumstances, and the support provided by the family is an important resource in that regard (Gore 1978; Pearlin et al. 1981; Milner et al. 2016; Umberson, Crosnoe, and Reczek 2010). Focusing on close ties within households, we considered the presence of a stable partner and his/her working status, as a source of social and economic support. According to some authors, having a partner should reduce the stress coming from adverse events, thanks to the symbolic and emotional dimensions that such a relationship entails, regardless of any economic benefits (Milner et al. 2016). The evidence presented here, however, suggests that benefits linked to the presence of a (female) partner also come from the economic stability that she can provide in terms of a second income. We find partners' employment to be at least as important as the mere presence of the partner in reducing the negative effect of job-loss on the individual's health, by maintaining the standard of living of the household and decreasing economic strain on the family (Ross, Mirowsky, and Goldsteen 1990).

Moreover, we also found important gender differences in relation to both job loss and family effects. This suggests the importance for labour and health policy makers to take into consideration and further distinguish the specific needs of men and women in Europe.

We also reported an important interaction between the family and the welfare state in moderating the health consequences of unemployment, showing how the compensation effect of the family varies across welfare regimes. The countries where we found this mitigating role of the family, namely Southern and Eastern welfare states, are those characterized by less developed social protection systems and – especially the Southern – high level of familialism (Esping-Andersen 1999; Eikemo and Bambra 2008; Ferrera 1996). Social protection in Southern welfare states is very much dependent on informal care and support at the household level. The family plays a decisive role in cushioning the adverse consequences of labour market risks. Furthermore, mechanisms of support and solidarity might also be possible in Eastern European countries, where the health consequences of unemployment have been shown to be smaller than in other welfare state regimes (Bambra and Eikemo 2009; WHO 2009).

Our results demonstrate that the welfare state not only shapes the nature and distribution of certain risks, and mitigates their consequences, but also interacts with other important inequality generating institutions, like the family. In less generous settings, the family comes into play to a greater extent, which cannot but lead to an increased stratification of inequalities across European countries, including inequalities in health. The family and especially the economic support that women's employment provides not only have the capacity to affect the distribution of economic resources themselves (Grotti and Scherer 2016), as literature has shown, but also the distribution of health.

Two conclusions can be drawn from our results. First, the further development of a (universalistic) welfare state certainly helps to mitigate the negative health effects of unemployment and, therefore, the future costs in terms of both individuals' health and

welfare spending. Second, the presence of a working partner is of crucial importance. Contrary to the role often attributed to emotional support our results clearly underline the relevance of employment rather than the mere presence of a partner indicating, once more, the relevance of employment policies directed at bringing women into paid work. In this sense, policies aiming to increase female labour market participation should be promoted especially in those contexts where the welfare state is less developed.

### **Limitations**

This study is not free of limitations. EU-SILC provides only a very short observation window (4-years panel). This implies that previous life-course events can be considered only to a very limited extent and we could not control for health selection in earlier work history, leaving unresolved other causality-related problems such as the possible bias driven by unobserved time-varying heterogeneity (Halaby 2004). This study has dedicated little attention to possible mediating mechanisms such as health behaviours as EU-SILC provides only very limited information. Lack of information in the data also prevented us from properly defining and measuring the emotional support provided by the partner. Neither information on the quality of the relationship (i.e. stability), nor a direct measure of emotional support are present in the dataset. Furthermore, our definition of the family – the presence of a partner and his/her employment situation – is maybe too reductive. For future research, a more detailed distinction of family types, individuals' health behaviours, and more accurate national life-history analyses would be desirable.

## References

Author et al. 2016 [details removed for peer review]

Bambra, C. 2007. 'Going beyond The Three Worlds of Welfare Capitalism: Regime Theory and Public Health Research'. *Journal of Epidemiology & Community Health* 61 (12): 1098–1102. <https://doi.org/10.1136/jech.2007.064295>.

Bambra, C., and Eikemo T. A., 2009. 'Welfare State Regimes, Unemployment and Health: A Comparative Study of the Relationship between Unemployment and Self-Reported Health in 23 European Countries'. *Journal of Epidemiology & Community Health* 63 (2): 92–98. <https://doi.org/10.1136/jech.2008.077354>.

Becker, G. S., 1981. *A Treatise on the Family*. Harvard University Press.

Blackwell, D. L., Hayward, M.D., and Crimmins, E.M., 2001. 'Does Childhood Health Affect Chronic Morbidity in Later Life?' *Social Science & Medicine* 52 (8): 1269–84. [https://doi.org/10.1016/S0277-9536\(00\)00230-6](https://doi.org/10.1016/S0277-9536(00)00230-6).

Burström, B., and Fredlund, P., 2001. 'Self Rated Health: Is It as Good a Predictor of Subsequent Mortality among Adults in Lower as Well as in Higher Social Classes?' *Journal of Epidemiology & Community Health* 55 (11): 836–840.

Catalano, R., Goldman-Mellor, S., Saxton, K., Margerison-Zilko, C., Subbaraman, M., LeWinn, K., and Anderson, E., 2011. 'The Health Effects of Economic Decline'. *Annual Review of Public Health* 32 (1): 431–50. <https://doi.org/10.1146/annurev-publhealth-031210-101146>.

Chung, H., and Muntaner, C., 2007. 'Welfare State Matters: A Typological Multilevel Analysis of Wealthy Countries'. *Health Policy* 80 (2): 328–39. <https://doi.org/10.1016/j.healthpol.2006.03.004>.

- CSDH. 2011. *Improving Equity in Health by Addressing Social Determinants*. Geneva: World Health Organization.
- DiPrete, T. A., 2002. 'Life Course Risks, Mobility Regimes, and Mobility Consequences: A Comparison of Sweden, Germany, and the United States'. *American Journal of Sociology* 108 (2): 267–309. <https://doi.org/10.1086/344811>.
- Eikemo, T. A., and Bambra, C., 2008. 'The Welfare State: A Glossary for Public Health'. *Journal of Epidemiology & Community Health* 62 (1): 3–6. <https://doi.org/10.1136/jech.2007.066787>.
- Eikemo, T. A., Bambra, C., Joyce, K., and Dahl, E., 2008b. 'Welfare State Regimes and Income-Related Health Inequalities: A Comparison of 23 European Countries'. *European Journal of Public Health* 18 (6): 593–99. <https://doi.org/10.1093/eurpub/ckn092>.
- Eikemo, T. A., Huisman, M., Bambra, C., and Kunst, A.E., 2008c. 'Health Inequalities According to Educational Level in Different Welfare Regimes: A Comparison of 23 European Countries: Health Inequalities According to Educational Level'. *Sociology of Health & Illness* 30 (4): 565–82. <https://doi.org/10.1111/j.1467-9566.2007.01073.x>.
- Eikemo, T. A., Bambra, C., Judge, K., and Ringdal, K., 2008a. 'Welfare State Regimes and Differences in Self-Perceived Health in Europe: A Multilevel Analysis'. *Social Science & Medicine* 66 (11): 2281–95. <https://doi.org/10.1016/j.socscimed.2008.01.022>.
- Esping-Andersen, G., 1990. *The Three Worlds of Welfare Capitalism*. 1 edition. Oxford: Polity Press.
- . 1999. *Social Foundations of Postindustrial Economies*. OUP Oxford.

- Ferrarini, T., Nelson, K., and Sjöberg, O., 2014. 'Unemployment Insurance and Deteriorating Self-Rated Health in 23 European Countries'. *J Epidemiol Community Health*, jech-2013.
- Ferrera, M., 1996. 'The "Southern Model" of Welfare in Social Europe'. *Journal of European Social Policy* 6 (1): 17–37. <https://doi.org/10.1177/095892879600600102>.
- Flint, E., Bartley, M., Shelton, N., and Sacker, A., 2013. 'Do Labour Market Status Transitions Predict Changes in Psychological Well-Being?' *Journal of Epidemiology and Community Health* 67 (9): 796–802. <https://doi.org/10.1136/jech-2013-202425>.
- Golden, S. D., and Perreira, K.M., 2015. 'Losing Jobs and Lighting up: Employment Experiences and Smoking in the Great Recession'. *Social Science & Medicine* 138: 110–18. <https://doi.org/10.1016/j.socscimed.2015.06.003>.
- Gore, S., 1978. 'The Effect of Social Support in Moderating the Health Consequences of Unemployment'. *Journal of Health and Social Behavior* 19 (2): 157–65. <https://doi.org/10.2307/2136531>.
- Gove, W. R., 1972. 'The Relationship between Sex Roles, Marital Status, and Mental Illness'. *Social Forces* 51 (1): 34. <https://doi.org/10.2307/2576129>.
- Grotti, R., Scherer, S., 2016. Does gender equality increase economic inequality? Evidence from five countries. *Res. Soc. Stratif. Mobil.* 45, 13–26.
- Hahn, B. A., 1993. 'Marital Status and Women's Health: The Effect of Economic Marital Acquisitions'. *Journal of Marriage and Family* 55 (2): 495–504. <https://doi.org/10.2307/352818>.

- Halaby, C. N., 2004. 'Panel Models in Sociological Research: Theory into Practice'. *Annual Review of Sociology* 30 (1): 507–44. <https://doi.org/10.1146/annurev.soc.30.012703.110629>.
- Hellevik, O., 2009. 'Linear versus Logistic Regression When the Dependent Variable Is a Dichotomy'. *Quality & Quantity* 43 (1): 59–74. <https://doi.org/10.1007/s11135-007-9077-3>.
- Idler, E. L., and Kasl, S. V., 1995. 'Self-Ratings of Health: Do They Also Predict Change in Functional Ability?' *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences* 50 (6): S344-353.
- Idler, E. L., and Benyamini, Y., 1997. 'Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies'. *Journal of Health and Social Behavior* 38 (1): 21. <https://doi.org/10.2307/2955359>.
- Jahoda, M., 1982. *Employment and Unemployment: A Social-Psychological Analysis*. CUP Archive.
- King, G., Keohane, R.O., and Verba, S., 1994. *Designing Social Inquiry: Scientific Inference in Qualitative Research*. Princeton, N.J: Princeton University Press.
- Knäuper, B., and Turner, P.A., 2003. 'Measuring Health: Improving the Validity of Health Assessments'. *Quality of Life Research* 12: 81–89.
- Korpi, T., 2001. 'Accumulating Disadvantage Longitudinal Analyses of Unemployment and Physical Health in Representative Samples of the Swedish Population.Pdf'. *European Sociological Review* 17 (3): 255–73. <https://doi.org/10.1093/esr/17.3.255>.



- Marmot, M. G., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E., Feeney, A., Marmot, M.G., and Smith G.D., 1991. 'Health Inequalities among British Civil Servants: The Whitehall II Study'. *The Lancet*, Originally published as Volume 1, Issue 8754, 337 (8754): 1387–93. [https://doi.org/10.1016/0140-6736\(91\)93068-K](https://doi.org/10.1016/0140-6736(91)93068-K).
- Milner, A., Krnjacki, L., Butterworth, P., and LaMontagne, A.D., 2016. 'The Role of Social Support in Protecting Mental Health When Employed and Unemployed: A Longitudinal Fixed-Effects Analysis Using 12 Annual Waves of the HILDA Cohort'. *Social Science & Medicine* 153: 20–26. <https://doi.org/10.1016/j.socscimed.2016.01.050>.
- Mood, C. 2010. 'Logistic Regression: Why We Cannot Do What We Think We Can Do, and What We Can Do About It'. *European Sociological Review* 26 (1): 67–82. <https://doi.org/10.1093/esr/jcp006>.
- Norström, T., and Grönqvist, H., 2015. 'The Great Recession, Unemployment and Suicide'. *Journal of Epidemiology and Community Health* 69 (2): 110–16. <https://doi.org/10.1136/jech-2014-204602>.
- Pearlin, L. I., Menaghan, E.G., Lieberman, M.A., and Mullan, J.T., 1981. 'The Stress Process'. *Journal of Health and Social Behavior* 22 (4): 337–56. <https://doi.org/10.2307/2136676>.
- Peirce, R. S., Frone, M. R., Russell, M., and Cooper, M.L., 1996. 'Financial Stress, Social Support, and Alcohol Involvement: A Longitudinal Test of the Buffering Hypothesis in a General Population Survey.' *Health Psychology* 15 (1): 38–47. <https://doi.org/10.1037//0278-6133.15.1.38>.

- Riumallo-Herl, C., Basu, S., Stuckler, D., Courtin, E., and Avendano, M., 2014. 'Job Loss, Wealth and Depression during the Great Recession in the USA and Europe'. *International Journal of Epidemiology* 43 (5): 1508–17. <https://doi.org/10.1093/ije/dyu048>.
- Ross, C. E., Mirowsky, J., and Goldsteen, K., 1990. 'The Impact of the Family on Health: The Decade in Review'. *Journal of Marriage and the Family* 52 (4): 1059. <https://doi.org/10.2307/353319>.
- Rubin, D. B. 1974. 'Estimating Causal Effects of Treatments in Randomized and Nonrandomized Studies.' *Journal of Educational Psychology* 66 (5): 688–701. <http://dx.doi.org/10.1037/h0037350>.
- Sarti, S., and Zella, S., 2016. 'Changes in the Labour Market and Health Inequalities during the Years of the Recent Economic Downturn in Italy'. *Social Science Research* 57 (May): 116–32. <https://doi.org/10.1016/j.ssresearch.2015.12.010>.
- Sjöberg, O., 2010. 'Social Insurance as a Collective Resource: Unemployment Benefits, Job Insecurity and Subjective Well-Being in a Comparative Perspective'. *Social Forces* 88 (3): 1281–1304. <https://doi.org/10.1353/sof.0.0293>.
- Steele, F., French, R., and Bartley, M., 2013. 'Adjusting for Selection Bias in Longitudinal Analyses Using Simultaneous Equations Modeling: The Relationship Between Employment Transitions and Mental Health'. *Epidemiology* 24 (5): 703–11. <https://doi.org/10.1097/EDE.0b013e31829d2479>.
- Stowasser, T., Heiss, F., and McFadden, D., 2012. 'Analysis of the Causal Pathways from Socioeconomic Status to Health'. In *Investigations in the Economics of Aging*, edited by David A. Wise, 267–317. A National Bureau of Economic Research Conference Report. Chicago ; London: The University of Chicago Press.

- Strandh, M., Hammarström, A., Nilsson, K., Nordenmark, M., and Russel, H., 2013. 'Unemployment, Gender and Mental Health: The Role of the Gender Regime'. *Sociology of Health & Illness* 35 (5): 649–65. <https://doi.org/10.1111/j.1467-9566.2012.01517.x>.
- Tøge, A. G., 2016. '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). <https://doi.org/10.1186/s12939-016-0360-6>.
- Tøge, A. G., and 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 (October): 171–78. <https://doi.org/10.1016/j.socscimed.2015.08.040>.
- Umberson, D., 1992. 'Gender, Marital Status and the Social Control of Health Behavior'. *Social Science & Medicine* 34 (8): 907–17. [https://doi.org/10.1016/0277-9536\(92\)90259-S](https://doi.org/10.1016/0277-9536(92)90259-S).
- Umberson, D., Crosnoe, R., and Reczek, C., 2010. 'Social Relationships and Health Behavior Across the Life Course'. *Annual Review of Sociology* 36 (1): 139–57. <https://doi.org/10.1146/annurev-soc-070308-120011>.
- WHO. 2009. 'The Financial Crisis and Global Health'. Report of a High-Level Consultation World Health Organization. Geneva: World Health Organization. [http://www.who.int/mediacentre/events/meetings/2009\\_financial\\_crisis\\_report\\_en.pdf](http://www.who.int/mediacentre/events/meetings/2009_financial_crisis_report_en.pdf).
- Wood, R. G., Goesling, B., and Avellar, S., 2007. 'The Effects of Marriage on Health: A Synthesis of Recent Research Evidence'. Mathematica Policy Research, Inc., 68.

## Appendix

**Table 1A**

Descriptive statistics. Mean of *bad health* by exposure and sample characteristics.

Variables	Description	SPH Mean (St.Dev)		Min	Max
		M	W		
Bad health	Self-perceived health	0.20 (0.40)	0.23 (0.42)	0	1
Working Status	Self-defined economic			0	1
Employed		0.19 (0.39)	0.21 (0.41)		
Unemployed		0.36 (0.48)	0.37 (0.48)		
Age	Age centred at 43	0.19 (0.39)	0.22 (0.41)	-13	12
Partner	Married or cohabitant			0	1
Partnered		0.20 (0.40)	0.22 (0.41)		
Not Partnered		0.20 (0.40)	0.26 (0.44)		
Household income	Equivalised disposable income (ln)			1	15
1° quintile		0.30 (0.46)	0.35 (0.47)		
2° quintile		0.23 (0.42)	0.27 (0.44)		
3° quintile		0.18 (0.38)	0.21 (0.41)		
4° quintile		0.15 (0.36)	0.17 (0.37)		
5° quintile		0.12 (0.32)	0.13 (0.34)		
Welfare	Welfare state regimes				
Nordic		0.14 (0.34)	0.15 (0.36)		
Conservative		0.17 (0.37)	0.19 (0.39)		
Liberal		0.17 (0.37)	0.19 (0.39)		
Southern		0.19 (0.39)	0.22 (0.41)		
Eastern		0.29 (0.45)	0.32 (0.47)		

**Table 2A**  
Sample size and number of transitions.

	Frequencies		
	M	W	Total
N observations	287,172	264,016	551,188
N respondents	139,432	130,953	270,385
N of unemployed observations	20,261	24,900	45,161
N of respondents with unemployed observations	14,600	18,052	32,652
N unemployment transitions	3,881	3,823	7,704

**Table 3A**  
Gender difference in the relationship between job loss and bad-health.

	Model 1b FE (adjusted)
Job loss	0.03***
Woman	omitted
Job loss*Woman	-0.02*
Income	-0.01***
Child < 16	0.00
Age	0.01***
Agesq	0.00***
Constant	0.28***
R <sup>2</sup> (FE within)	0.0007
N observations	551,188
N individuals	270,385

Legend: \*p<.05; \*\* p<.01; \*\*\* p<.001  
Adjusted for Robust Standard Errors

**Table 4A**  
Fixed effect logistic regression model (OR)

	Model 1b FE (adjusted)	
	M	W
Job loss	1.32***	1.16**
Income	0.90***	0.95
Child < 16	1.09	0.93
Age	1.07***	1.04***
Agesq	1.00	1.00*
N observations	52,801	49,068
N individuals	18,539	17,450

Legend: \*p<.05; \*\* p<.01; \*\*\* p<.001  
Adjusted for Robust Standard Errors  
Numerosity reduced because Logistic regression excludes cases where the outcome does not vary.

**Table 5A**  
Average Marginal Effect (Model 1b)

	Model 1b (Adjusted) AME	
	M	W
Job loss	0.057***	0.035**

Legend: \*p<.05; \*\* p<.01; \*\*\* p<.001