Social Science & Medicine 276 (2021) 113843

Contents lists available at ScienceDirect

Social Science & Medicine

journal homepage: http://www.elsevier.com/locate/socscimed

Health shocks and couples' labor market participation: A turning point or stuck in the trajectory?

Aart-Jan Riekhoff [a,*], Maria Vaalavuo [b]

[a] Finnish Centre for Pensions, FI-00065, ELÄKETURVAKESKUS, Finland
[b] Centre for Health and Social Economics, Finnish Institute for Health and Welfare, P.O. Box 30, FI-00271, Helsinki, Finland

ARTICLE INFO

Keywords:
Cumulative advantage
Employment
Family spillover
Health shock
Linked lives
Sequence analysis

ABSTRACT

A health shock can have lasting consequences for the employment of not only the individuals experiencing it, but also their spouses. In this article, we complement the individual approach to the impact of health shocks with a dyadic perspective and show how employment opportunities and restrictions within couples are interdependent in the face of severe illness. We investigate whether the association between male spouses' health shocks and couples' employment trajectories depends on household specialization and both spouses' education. Multichannel sequence analysis is applied to retrospective life-course data from the Survey for Health, Ageing and Retirement in Europe for couples with health shocks and their matched controls (N = 1022). By identifying typical employment trajectories, we find that health shocks are negatively associated with trajectories where both spouses continue in full-time employment and positively with trajectories where the man retires while the woman continues working and where both spouses retire simultaneously. Couples' trajectories differ according to the spouses' combined education levels. Findings suggest that health shocks may exacerbate economic inequalities within and between couples.

1. Introduction

Surviving a severe and acute illness can disrupt peoples' lives and have various long-term consequences. Attachment to the labor market, productivity at work, and preferences regarding work and leisure are likely to be affected during illness, treatment, and convalescence. Studies have found detrimental effects on the person's labor market outcomes in terms of employment and earnings, even long after the illness occurred and was treated (Jeon, 2017; Lundborg et al., 2015; Trevisan and Zantomio, 2016).

Effects are not limited to the individual that falls ill but extend to others in the household. Within couples, spillover effects concern especially labor supply decisions of the spouse (Fadlon and Heien Nielsen, 2019; García-Gómez et al., 2013; Jeon and Pohl, 2017). The reaction of the spouse can either smoothen or reinforce the earnings loss of the individual, which makes it an important element in understanding how health shocks affect economic well-being and inequality. In this article, our principal research question is how a male spouse's health shock is associated with the couple's employment trajectories. Furthermore, we investigate the role of a couple's joint, rather than spouses' individual, socioeconomic characteristics.

Previous studies have gained conflicting results regarding the labor supply of spouses following a health shock. This could be due to the lack of investigation into differences in characteristics of spouses in relation to each other. Couples have 'linked lives' (Elder et al., 2007; Settersten, 2015), while decisions about work and career depend on earlier divisions of labor within the household (Juhn and McCue, 2017; Langner, 2015). When a health shock occurs, a couple is likely to reassess possibilities for labor supply in congruence and based on those earlier divisions of labor. Looking at spouses together could contribute significantly to our understanding of spillover effects of a health shock.

Studying the relationship between adverse life-course events and changes in employment patterns also sheds light on how couples' combined predispositions buffer or exacerbate the negative consequences of such events. The theory of cumulative (dis)advantage suggests that social inequalities between individuals increase across the life course (Dannefer, 2003; DiPrete and Eirich, 2006), while research on the role of assortative mating suggests that inequalities are even greater when comparing households (Breen and Salazar, 2011). Health shocks could exacerbate inequalities between and within couples that have already been building across the life course.

In our analysis, we focus only on opposite-sex couples where the

* Corresponding author.
E-mail addresses: arie.riekhoff@etk.fi (A.-J. Riekhoff), maria.vaalavuo@thl.fi (M. Vaalavuo).

https://doi.org/10.1016/j.socscimed.2021.113843
Received in revised form 16 February 2021; Accepted 10 March 2021
Available online 13 March 2021

male spouse experiences a health shock and on matched controls without a health shock. Ideally, couples where the woman experiences the health shock are also analyzed. However, pooling the couples with men and women's health shocks would not do justice to the strongly gendered division of labor within couples. A choice was made for couples where the male spouse experiences the health shock, given that during most of the period and in most countries under scrutiny, men have been the sole or main breadwinners and their health shock is expected to make the greatest impact on the livelihood of the household.

We contribute to the literature on the economic effects of health shocks and family spillovers by combining it with a dyadic life-course perspective on couples' employment trajectories. Using multichannel sequence analysis (MCSA) and cluster analysis on rich cross-European data, we identify and visualize patterns of couples' simultaneous labor market behavior in several years before and after a male spouse's health shock. Moreover, we focus on how educational inequalities within and between couples shape these employment trajectories. This life-course perspective complements earlier regression-based approaches to health shocks and family spillovers by studying labor market statuses and transitions in their continuity (Aisenbrey and Fasang, 2010) and showing how spouses' employment trajectories are interlinked in the face of adversity.

2. Theory and literature

2.1. Health shocks, couples and labor market outcomes

Previous research has found that health shocks matter for labor market outcomes, not only to the individual experiencing the health shock, but also to the spouse, while socioeconomic status is associated with the prevalence of health shocks as well as with the severity of the consequences of ill health. These studies are the starting point of our investigation.

The direction of the relationship between health and labor market status is a subject of permanent scientific debate (Kröger et al., 2015). Poor health not only creates a risk of not being employed, but unemployment or poverty can also lead to deterioration in health (Vaalavuo, 2016) . While previous worse health and health behaviors (e.g. smoking and obesity) increase the risk of health shocks in lower socioeconomic groups, sudden and unanticipated health shocks are often employed as exogeneous events that occur rather randomly in the population. Even when socioeconomic factors have been controlled for, health shocks have been shown to subsequently increase the risk of lower earnings, reduced working hours and permanent (early) exit from the labor market in various institutional settings (García-Gómez et al., 2013; Gupta et al., 2015; Jeon, 2017; Trevisan and Zantomio, 2016).

Findings on the impact of a health shock on spouses' employment and earnings are often conflicting. In some cases, an *added-worker effect* is identified: the spouse increases his/her labor supply in order to compensate for the loss of income due to the sick spouse's reduced work effort (Acuña et al., 2019; García-Gómez et al., 2013; Jeon and Pohl, 2017). In addition, the household's costs of living might increase due to medical expenses and the need to buy additional services (Wu, 2003). On the other hand, the healthy spouse may decide to reduce labor supply. This can be due to the need to provide care for the ill spouse (the *caregiver effect*) or a preference for spending more time together (the *joint-leisure effect*) (Braakmann, 2014; Jeon and Pohl, 2017).

Various factors moderate the effects of health shocks on couples' labor market adjustment. At older age, resilience, incentives and possibilities to resume work after a severe health shock may be reduced, while there might be possibilities for labor market exit through pension and disability schemes (Jiménez-Martín et al., 2006). For example, Acuña et al. (2019) found the added-worker effect only for younger age groups. Coile (2004) concluded that particularly among older couples, the added-worker effect was small. Johnson and Favreault (2001) found that both older men and women in the US were less likely to retire if their spouses left the labor force due to health problems, especially if the pension eligibility age had not been reached.

Moreover, studies have found the negative effects of health shocks to be stronger among lower socioeconomic groups (Jeon, 2017; Lundborg et al., 2015). For example, Vaalavuo (2021) found that breast cancer more negatively affected earnings among women with lower prior earnings, with low level of education, and in blue-collar occupations. Therefore, we also expect heterogeneous effects for couples with different levels of resources.

2.2. Linked lives, specialization and employment trajectories

Studies on health shocks tend to overlook that the lives of the couple are "linked" (Elder et al., 2007; Settersten, 2015): couples share a history in affective and economic terms. Therefore, decisions about work are unlikely to be made *ad hoc* in the context of a health shock. Nevertheless, in a couple's shared life course, a health shock can be considered a turning point (Nitsche and Grunow, 2016; Rönkä et al., 2003). Turning points, such as marriage, childbirth, divorce, unemployment or retirement are major life-course events that require a reassessment of the division of labor within the household (DiPrete and McManus, 2000). In the same vein, a severe health shock can disrupt an existing balance between spouses.

A couple's adjustment to a health shock is likely to depend on the combined employment histories of both spouses. Theories of specialization predict that couples decide that one spouse, usually the one with potentially higher earnings and usually the man, specializes in paid work, whereas the other takes care of the household (Becker, 1985; Juhn and McCue, 2017; Killewald and Gough, 2013). Decisive time-points for the division of tasks take place usually early in the couple formation phase as well as at the time of having children (Goñalons-Pons and Schwartz, 2017; Langner, 2015) or later in life, close to the age of retirement (Kridahl and Kolk, 2018; Visser and Fasang, 2018).

When a health shock occurs, the couple most likely is set on a life-course trajectory where the division of labor within the household is explicitly or implicitly agreed upon. If the man is forced to reduce working hours or stop working completely, his spouse is likely to decide to adjust work effort based on the stage of her career, the possibilities for changing work hours, and the marginal costs or benefits that changes in labor supply would provide. For example, if a woman has been a homemaker for most of her life, she is unlikely to suddenly enter the labor market (Muller et al., 2020). In this case, the man might have a greater incentive to continue working despite the health shock. In other words, changes in labor supply of both spouses following a man's health shock depend on the intra-household division of work before the health shock emerged.

The role of household specialization and coordination in couples' adjustment to health shock can be illustrated by the literature on couples in the cases of other turning points, such as unemployment and retirement. Ehlert (2015) analyzed the added-worker effect after unemployment of one partner in Germany and the USA and showed that its emergence depends on the partners' distribution of paid and unpaid work before the onset of unemployment. In male breadwinner couples, the added-worker effect was less likely than in dual-earner couples. Literature on coordinated retirement shows that couples tend to exit the labor market in close proximity, but that there are differences between male and female main-breadwinner as well as dual-career couples (Bertogg et al., 2020; Kridahl and Kolk, 2018).

2.3. Health shocks and educational level of the couple: hypotheses

The couple's previous employment trajectories and their adjustment to the health shock are likely to depend on the couple's combined education levels and, consequently, expected earnings of each spouse. Therefore, the focus of our article lies in studying the role of spouses' combined educational levels for employment trajectories before and

after the health shock of a male spouse.

In couples where the man is higher educated than the spouse (i.e. hypogamy) there is greater pressure on the ill-struck to continue working, given that he probably has higher earnings or is the sole breadwinner. However, if the consequences of the health shock prevent him from continuing to work, the female spouse is unlikely to increase labor supply. If previously employed, she might consider retirement or reducing work hours due to the low marginal gains from work. For example, closer coordination of retirement timing was found by Kridahl and Kolk (2018) among Swedish married couples when the husband was higher educated than the wife.

Hypothesis H1. In educationally hypogamous couples, the man is less likely to reduce his work effort, while the female spouse is less likely to maintain or increase levels of work effort following a health shock.

At the same time, we expect that in the case of hypergamy, i.e. the woman's education is higher than her sick spouse's, she is more likely to continue to work while the man exits the labor market following the health shock. The man is likely to gain less from continuing to work, while the woman enjoys higher marginal gains and possibly displays greater labor market attachment.

Hypothesis H2. In educationally hypergamous couples, the man is more likely to reduce his work effort, while the female spouse is more likely to maintain her work effort or increase it following a health shock.

In couples characterized by educational homogamy, relative earnings potential expectedly plays a smaller role. Rather, the couples reassess the *opportunities* and *needs* for adjusting the labor supply of both spouses. Lower-educated men are likely to have fewer possibilities to continue working than their higher-educated counterparts due to possibly more limited access to health care, more insecure employment, and fewer possibilities to adjust at the workplace. At the same time, among lower-educated homogamous couples, household income was probably already lower before the health shock, necessitating especially the women in those couples to continue working. However, it is also possible that higher-educated couples have better financial resources for the man to retire or reduce work, while the woman chooses to remain employed. Therefore, we formulate two contrasting hypotheses:

Hypothesis H3a. Men with health shocks in lower-educated homogamous couples are more likely to reduce their work effort than those in higher-educated homogamous couples, while women in lower-educated homogamous couples are more likely to maintain or increase their work effort.

Hypothesis H3b. Men with health shocks in higher-educated homogamous couples are more likely to reduce their work effort than those in lower-educated homogamous couples, while women in higher-educated homogamous couples are more likely to maintain or increase their work effort.

3. Data and methods

3.1. Data and study population

This study makes use of the Survey on Ageing, Health and Retirement in Europe (SHARE), in particular, the retrospective life course data (SHARELIFE) collected in waves 3 and 7 (Börsch-Supan, 2019a, 2019b; Börsch-Supan et al., 2013). In SHARELIFE, respondents 50 years and older are asked about their personal histories related to, amongst others, work, relationships, and health. Spouses (including those younger than 50) are interviewed as well and are linked in the data, which makes it an outstanding source of information for the current study. We combine data from wave 3 (collected in 2008–2009) and wave 7 (collected in 2017) for 29 countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and Switzerland.

Fig. 1 shows how the study sample was constructed. In a first step, we selected men that were living with a female spouse. Hence, we focus on cohabiting opposite-sex couples, both married and unmarried. Next, we restricted the sample to cases where a severe health shock occurred while the couple was already together at that time. In waves 3 and 7 of the SHARE retrospective survey, respondents are given a card with a list of health conditions and are asked if they ever suffered from any and, if so, to provide the years of the start and, if available, the end. In this study, health shocks include the occurrence of three types of conditions: angina or heart attack, stroke, and cancer, malignant tumor, leukemia or lymphoma.

This selection of health shocks was made because these conditions can be considered as unanticipated, severe and likely to incapacitate the patient at least partially. They are often considered to be exogenous shocks (Jeon and Pohl, 2017; Trevisan and Zantomio, 2016). The data includes a range of other illness and disease categories, but for those the severity, anticipation and exogeneity criteria do not necessarily apply. Although people can suffer from several health shocks during their life and the data includes the occurrence of up to three, we only analyze the event of the first health shock.

Because we are mainly interested in couples that were likely or had the possibility to be active in the labor market at the time of illness, individuals and their spouses who were older than 60 at the time of the health shock were excluded from the data. Although official and effective retirement ages differ between countries and can change across time, we assume that at age 60 workers were not eligible for old-age pensions yet. Also, because we follow couples until five years after the health shock, age 60 is a relevant cut-off point. It can be assumed that after the age of 65 transitions out of work are driven more by "natural" retirement processes than the consequences of the health shock, as respondents usually have reached their official retirement ages.

Cases where either spouse had more than four years of missing data on labor market statuses around the year of the health shock were removed. Although in sequence analysis missing data is technically not necessarily a problem, it was decided that more than four years of missing statuses limits the possibilities for constructing meaningful sequences. As a result, a total of 514 couples with health shocks remained.

To test whether a health shock is associated with differences in employment patterns, we created a control group of couples including the men living with a spouse and not included among the cases (Fig. 1, right side). To avoid the possibility that cases are selected on other characteristics than the simple occurrence of the health shock (e.g. unhealthy behaviors), it is therefore possible that match controls did experience a similar health shock at some point during their lives. In one instance, this was more than ten years earlier, in two instances this was during the observation period but at a later age than the matched case and among the remaining 22 instances this was after the observation period of this study.

Each twin was matched exactly by the male spouse's level of education, country of residence, and the wave of data collection. The variable for level of education is based on ISCED and recoded into three levels: low, intermediate and high. Additionally, cases and controls were matched by year of birth and relationship length, allowing a margin of five years of difference on these variables. In each case the closest possible match was selected, resulting in minimal differences on these two variables (see Table 1). All variables were measured at the time of the health shock or, for the control group, at the same age as when their twin's health shock occurred. Like the couples with health shock, potential controls with more than four years of missing sequence observations during the follow-up were removed. For three cases, no matching control was found. As each case was matched with one control, this left a combined study population of 1022 couples.

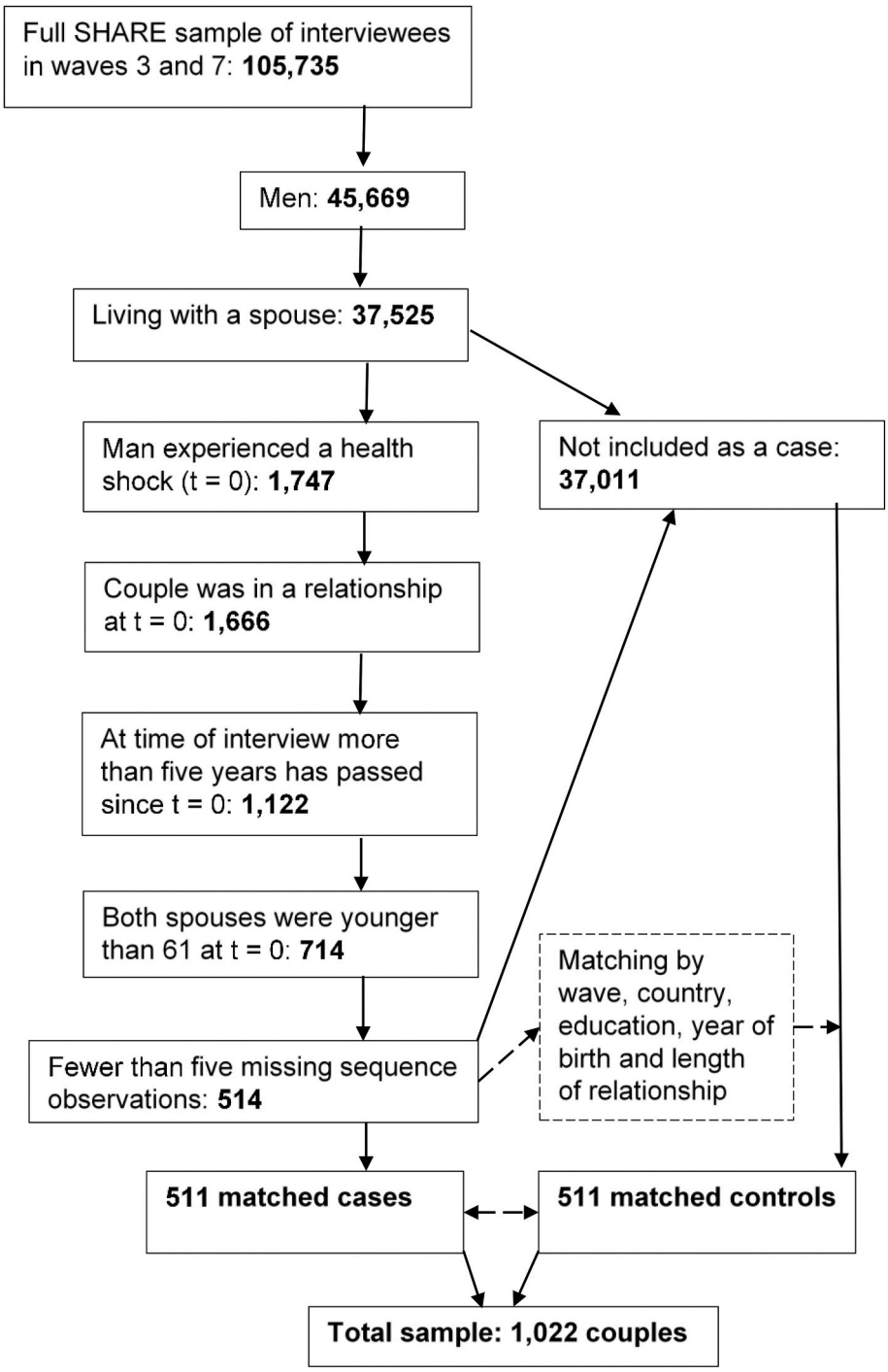


Fig. 1. Sample selection.

3.2. Sequence data and sequence analysis

The SHARE Jobs Episodes Panel data (JEP) (Brugiavini et al., 2019a, 2019b) was used to create sequences of labor market statuses. JEP is based on the retrospective questions in waves 3 and 7 about respondents' employment histories. Respondents were requested to list spells of whether and when they were employed, unemployed, retired, etc. For employment spells, characteristics were asked about each job. In JEP, for each individual labor market status is indicated for each age/-year. We distinguish seven labor market statuses for both spouses: full-time (FT) employed, part-time (PT) employed, unemployed, sick/-disabled, homemaker, retired and other. "Other" includes such statuses as being a student or a military conscript. Missing statuses are included as a separate state.

The sequences for both spouses encompass five years preceding and five years following the year of the health shock. The year of the health shock is indicated as $t = 0$. For the controls without the health shock, the age when the health shock of their matched cases occurred was selected as the corresponding $t = 0$. In other words, the cases and their matched controls are followed across the same ages. The eleven-year follow-up was selected to analyze a reasonably long period with sufficient information on the past employment trajectory as well as its continuation or change in adjacent years. A longer observation period would have been preferable but would reduce the number of observations further, as the

Table 1
Descriptive statistics of independent variables, percentages and means (SD).

Variable		Cases with health shock	Controls without health shock
Combined education	Low-level homogamy	26.8%	28.0%
	Medium-level homogamy	24.3%	24.8%
	High-level homogamy	9.8%	10.2%
	Hypogamy (man higher education than spouse)	22.3%	18.9%
	Hypergamy (man lower education than spouse)	16.8%	18.0%
Male spouse's age at t = 0		49.2 (8.5)	
Age difference within couple		3.1 (3.8)	3.1 (3.8)
Underaged children in the household at t = 0		40.3%	40.5%
Financial hardship at t = 0		11.7%	6.5%
Year of t = 0		1994.9 (10.3)	1994.9 (10.3)
Geographical region	Continental	19.4%	
	Nordic	9.6%	
	Mediterranean	16.4%	
	Liberal hybrid	4.1%	
	Visegrád	22.5%	
	Baltic	11.0%	
	South-East	17.0%	
Wave 7 of data collection		64.6%	

incidence of health shocks tends to be concentrated at later ages.

To examine the sequences of states of both spouses simultaneously, multichannel sequence analysis (MCSA) is applied (Gauthier et al., 2010). Sequence analysis is a family of methods developed to analyze ordered lists of items or states (Abbott, 1995). It allows analyzing events and transitions in their continuum rather than focus on single events and is therefore highly suitable to study life-course processes across time (Aisenbrey and Fasang, 2010). In MCSA, sequences of states in two (or more) separate "channels" are analyzed simultaneously. In our case, the two channels are the labor market statuses of both spouses.

We used the dynamic Hamming distance (DHD) measure to calculate distances between the sequences (Gabadinho et al., 2011). DHD discards the so-called insertion-deletion costs and calculates the substitution costs at each *t* from the cross-section of transition rates between each *t* and *t - 1* and between each *t* and *t + 1* (Lesnard, 2010). It is a variety of the commonly used Optimal Matching (OM) technique and especially suitable for sequences where timing of transitions is crucial. In our case, it makes a meaningful difference whether transitions in and out of work occur before or after the (non-)event of the health shock.

Ward cluster analysis was applied to the distance matrix. Cluster quality indicators indicated optimal cluster solutions of either six or eight clusters, with almost no difference in the values of Point Biserial Correlation (PBC) or Average Silhouette Width (ASW) (Studer 2013). We decided for the eight-cluster solution (PBC = 0.71, ASW = 0.51) as it showed an additional distinction between trajectories where the male spouses continued in FT (clusters 5 and 7) and where they retired (clusters 6 and 8) in clusters characterized by women working PT (clusters 5 and 6) or being homemakers (clusters 7 and 8). The clusters are visualized (Helske and Helske, 2019) and described in the "Results" section.

3.3. Multinomial logistic regression and variables

We investigate the individual and couple characteristics that are associated with each trajectory by applying multinomial logistic regression analysis with the obtained clusters as outcome variables. We use the 'mlogit' command in Stata 16. In this model, we estimate coefficients corresponding to each outcome category *k* (variable *trajectory* as identified above) and we measure association relative to the outcome $k = 1$ (base category, i.e. cluster 1) as written in:

$$ln\left(\frac{P(trajectory = k)}{P(trajectory = cluster\ 1)}\right) = B_{k0} + B_{k1}educ_i + B_{kn}X_n$$

where B_{k0} is the constant term for group *k* and B_{k1} is the coefficient in group *k* for $educ_i$ that indicates the educational composition of the couple for the individual *i*. $B_{kn}X_n$is the matrix of control variables as explained below for group *k*.

Our main independent variable of interest is the educational composition of the couples. Using information on the education levels of the male and female spouses, we created five categories: low-level homogamy (both partners have low education), medium-level homogamy (both have medium education), high-level homogamy (both have high education), hypogamy (male spouse's education is higher than his female counterpart) and hypergamy (male spouse's education is lower than his female counterpart). As the samples were matched based on the individual's characteristics only, Table 1 shows that the female spouses' education levels differ between the two groups. However, a Pearson's Chi-square test reveals that differences between case and control groups are not statistically significant.

Besides the age of the male spouse at the time of the health shock, we control for the age difference within the couple. The age difference might be an indicator of bargaining power within the couple and the likelihood that retirement timing is coordinated (Kridahl and Kolk, 2018; Visser and Fasang, 2018). A positive age difference indicates that the male spouse is older. Additionally, we control for the presence of underaged children in the household at the time of the health shock.

The survey does not include reliable retrospective information on the couples' income and wealth. Yet, it includes information on whether respondents have ever experienced a period of financial hardship and its timing. This information for both spouses was used to create a new dichotomous financial hardship variable: at least one partner experienced hardship at t = 0 or neither of them did. Out of the 93 couples where at least one spouse indicated to have experienced hardship at t = 0, only in 29 couples both spouses experienced hardship at the same time. Therefore, given the highly subjective nature of this indicator, it should be interpreted with caution. Nevertheless, Table 1 shows that financial hardship was more common among the couples with the health shock.

To control for period effects, we included a variable for the year of the (non-)event of the health shock. Labor markets and working life have changed considerably since the 1960s, i.e. when we record the first health shock in the data. Furthermore, the risks of certain health shocks may have changed in recent years whereas the treatment of some diseases and conditions, especially cancer, has improved. At the same time, survival chance until the date of interview is greater when the health shock took place more recently. Finally, divorce rates have changed over time, affecting the selection into the study sample.

Due to the relatively low number of cases per country, it was not possible to control for country-fixed effects. Instead, countries were grouped in seven clusters that broadly reflect a shared history, geographical location and welfare regime. These are Continental (Austria, Belgium, France, Germany, Luxembourg and the Netherlands), Nordic (Denmark, Finland and Sweden), Mediterranean (Cyprus, Italy, Greece, Malta, Portugal and Spain), Liberal/hybrid (Ireland, Israel and Switzerland), Visegrád (Czech Republic, Hungary, Poland and Slovakia), Baltic (Estonia, Latvia and Lithuania) and South-East European (Bulgaria, Croatia, Romania and Slovenia).

In the multinomial logistic regression models, we first entered all the variables to investigate whether the health shock is associated with specific types of couples' labor market trajectories while controlling for individual and couple's characteristics. Next, we introduced interactions

of the health shock dummy and the couple's education variable to analyze whether couple's combined education modifies the association between health shock and employment trajectory. Average marginal effects are reported to facilitate the interpretation of the results of non-linear interaction and coefficients on a logistic scale (Mize, 2019).

With the use of MCSA and multinomial logistic regression, the aim of the study is to identify patterns in couples' labor market adjustment and the factors related to these. It should be noted, however, that under this research design no strict causal claims can be made, given the variety of ways in which health, socioeconomic status and labor market behavior are interlinked.

4. Results

4.1. Sequences and clusters of employment trajectories

Fig. 2 visualizes the sequence data stratified by the male (top row) and female spouses (bottom row) and those couples experiencing a health shock (left side) and those without (right side). The x-axis shows the time in years before and after the (non-)event of the health shock (t = 0). The y-axis indicates the share of cases in each state in each year. The plots demonstrate that men experiencing a health shock were more likely to retire at t = 0 or during the five years afterwards. Men without a health shock and their spouses were also gradually retiring during the follow-up. However, the difference between the cases and controls is clear especially for the male spouses: five years after the health shock around 40 per cent of the men were still in (full- or part-time) employment compared to around 70 per cent of the men without a health shock.

Fig. 3 shows the state index plots of both spouses for each of the eight employment trajectories that were identified through MCSA and cluster analysis. In state index plots, each vertical line represents one individual sequence. The plots of both spouses are linked and sorted by the male spouses' starting states. Table 2 describes the relative size of each cluster and the incidence of couples with health shocks within each cluster.

The first cluster contains 47.0 per cent of all the couples. In this cluster, both the men the menand their spouses mainly work full-time throughout the eleven years. Couples without health shocks dominate this cluster, although it is the most common pattern among couples with health shocks as well. In cluster 2 (12.9% of all couples), the men retire soon after t = 0, while their spouses largely remain in employment. Cases with a health shock dominate in this cluster. Cluster 3 (9.0%) is characterized by couples retiring around the same time. Here, couples with health shocks are in the majority. In cluster 4 (7.0%), men work full-time throughout whereas women experience somewhat unstable careers, with transitions in and out of work, retirement, unemployment and other statuses. Cases with a health shock are less common in this cluster.

Clusters 5 (6.6%) and 6 (4.0%) are characterized by the women predominantly working part-time. In cluster 5, the male spouses mostly work full-time throughout, while in cluster 6 they tend to retire after t = 0. Unsurprisingly, the couples with a health shock are more frequent in cluster 6. In clusters 7 (9.0%) and 8 (4.6%) women are mostly homemakers, while men are continuously full-time employed (cluster 7) or retire after t = 0 (cluster 8). Again, the couples with health shocks are more present in the cluster where the male spouses retire. Remarkably, none of the eight clusters capture an increase in work effort among women.

4.2. Multinomial logistic regression models

Table 3 reports the average marginal effects of a health shock on the likelihood of belonging to each of the eight clusters. There is a substantial statistically significant association between the occurrence of a health shock and employment trajectory in clusters 1 and 2 and, to a smaller degree, in clusters 3 and 6. The experience of a health shock is

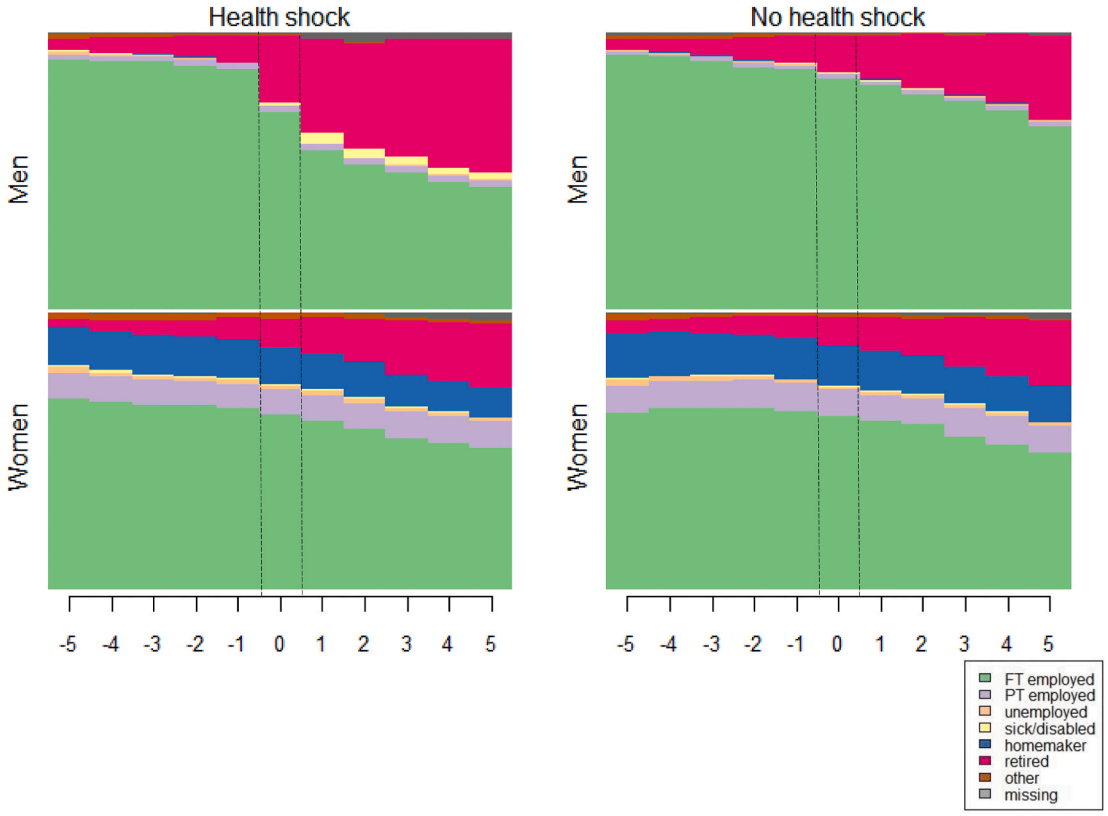
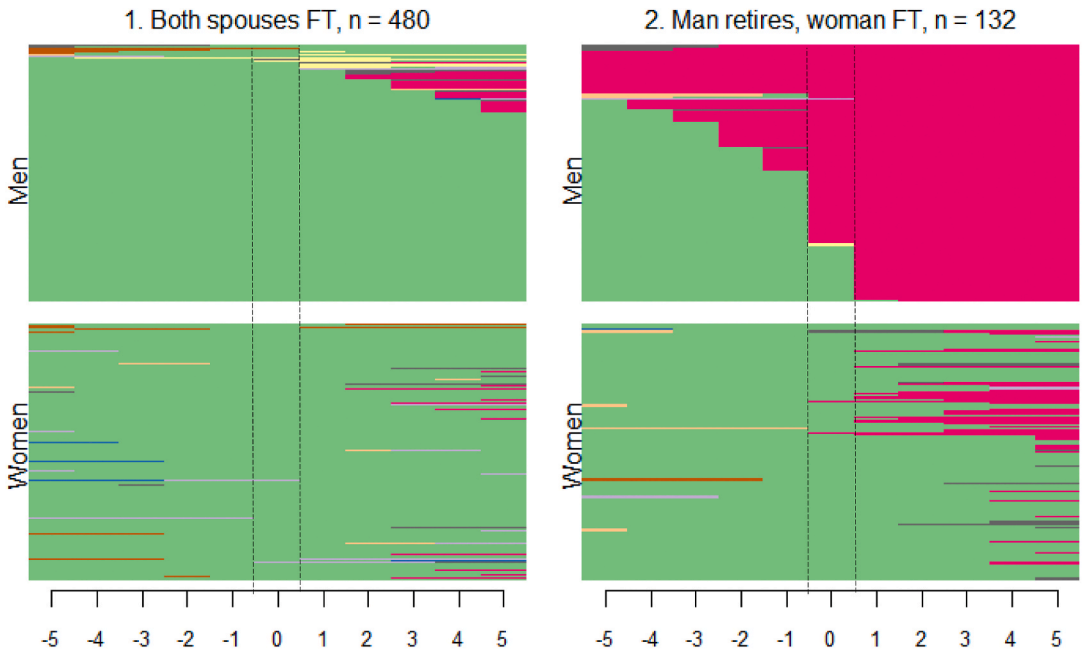


Fig. 2. State distribution plots, labor market statuses of male and female spouses, men with and without health shocks. Note: Time t = 0 denotes the time of the (non-event) of the health shock.



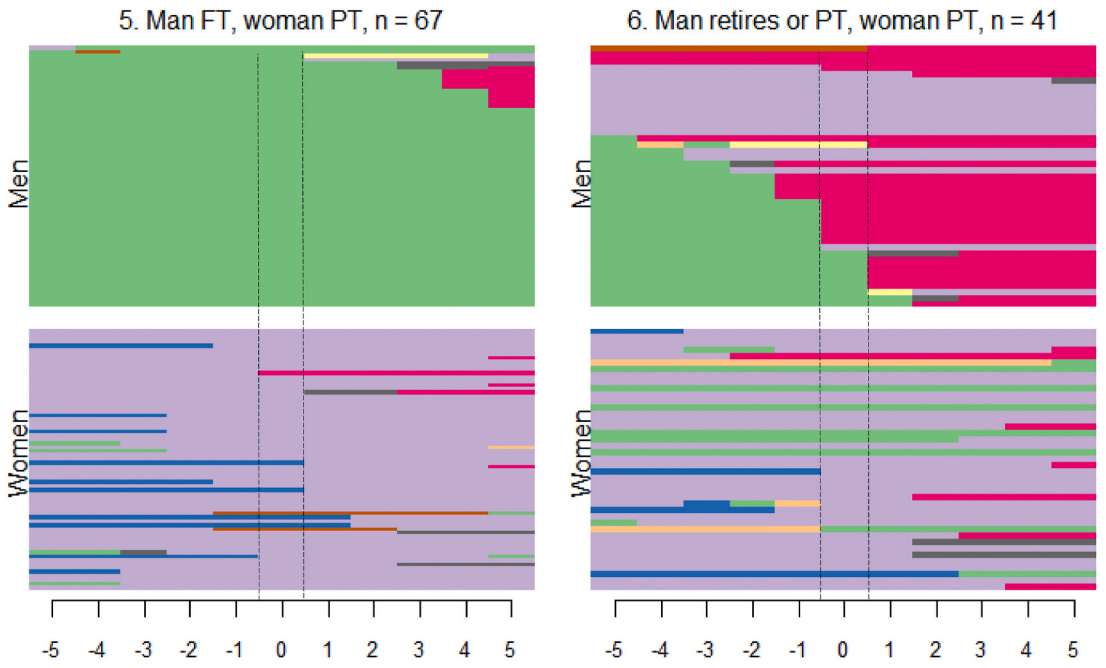
a. State index plots for clusters 1 and 2, sorted by man's starting state

b. State index plots for clusters 3 and 4, sorted by man's starting state

Fig. 3. a. State index plots for clusters 1 and 2, sorted by man's starting state. Fig. 3b. State index plots for clusters 3 and 4, sorted by man's starting state. Fig. 3c. State index plots for clusters 5 and 6, sorted by man's starting state. Fig. 3d. State index plots for clusters 7 and 8, sorted by man's starting state.

related to a 13.4 per cent decrease in the probability that the couple is in a trajectory where they both continue working full-time and a 10.6 per cent increase in the probability of being in a trajectory where the man exits while the woman continues to work full-time. Moreover, the health shock is associated with a 4.6 per cent higher risk of being in the coordinated retirement cluster. There is also a 2.5 per cent higher probability of being a trajectory where the man retires while the woman works part-time.

Table 3 also reports the results for all the non-interacted independent variables and controls. It shows the importance of the male spouse's age, the age difference within the couple, their combined education, and country group. Weak associations were found with having underaged children in the household (cluster 8) or having experienced financial hardship (cluster 5). The year variable indicates that the occurrence of



c. State index plots for clusters 5 and 6, sorted by man's starting state

d. State index plots for clusters 7 and 8, sorted by man's starting state

Fig. 3. (*continued*).

the trajectories was relatively stable across time, although trajectories where women work part-time or have unstable careers increased somewhat, while couples where female spouses are homemakers became less common.

Table 4 displays the results for the interactions between a health shock and the couples' combined education (same control variables included as in Table 3, but not reported). The average marginal effects indicate the risk of selection into each of the clusters for the group experiencing a health shock compared with the group where no health shock occurred. Again, health shocks are mainly associated with clusters 1 and 2. In the case of low-level homogamy, a health shock is associated with a 14.8 per cent decrease in the likelihood of belonging to cluster 1, while it increases the risk of being in cluster 2 by 16.4 per cent. Among mid-level homogamous couples these associations are similar, yet smaller. Among high-level homogamous couples none of the associations are statistically significant. As suggested by our Hypothesis H3a, these findings may reflect that lower- and middle-educated men have worse opportunities to adjust their work to cope with incapacity, while their spouses experience the need to continue working.

When the man is higher educated than his spouse (i.e. hypogamy), a

Table 2
Cluster summary statistics.

Cluster	Description	% of total study population	% of couples in the cluster with health shock
1	Both spouses FT	47.0	43.1
2	Man retires, woman FT	12.9	69.7
3	Coordinated retirement	9.0	63.0
4	Man FT, woman unstable career	7.0	43.7
5	Man FT, woman PT	6.6	43.3
6	Man retires or PT, woman PT	4.0	65.9
7	Man FT, woman homemaker	9.0	40.2
8	Man retires, woman homemaker	4.6	63.8

health shock is associated with a 16.3 per cent lower probability that both spouses are in continuous full-time employment. The association with cluster 2 is not significant, but the likelihood of coordinated retirement (cluster 3) increases with 7.6 per cent. Moreover, the health shock is associated with a 5.3 per cent higher probability of belonging to cluster 6 where the man retires while the woman works part-time. These results only partly support our Hypothesis H1, as men in hypogamous couples were not overall less likely to reduce their work effort. However, their spouses were more likely to retire at the same time.

For hypergamous couples, the probability of the couple being in the trajectory where the woman continues working full-time while her lower educated spouse retires (cluster 2) is 13.7 per cent higher if a health shock occurs, while the association with cluster 1 is not significant. These results support our Hypothesis H2. Also, the health shock is negatively related to the cluster where the man continues in full-time employment while his spouse works part-time (cluster 5).

Several robustness checks were performed. First, we tested whether the cut-off point of t = 0 at age 60 in the sample selection bears effect on

Table 3
Multinomial logistic regression with eight clusters (average marginal effects).

		1	2	3	4	5	6	7	8
		Both spouses FT	Man retires, woman FT	Coordinated retirement	Man FT, woman unstable career	Man FT, woman PT	Man retires or PT, woman PT	Man FT, woman homemaker	Man retires, woman homemaker
Health shock		−0.134***	0.106***	0.046**	−0.018	−0.015	0.025*	−0.030	0.021
Man's age		−0.024***	0.003	0.020***	0.003*	−0.004**	0.001	−0.005***	0.006***
Age difference with woman		0.018***	0.001	−0.013***	−0.009***	−0.000	0.001	0.002	−0.001
Underaged children in household		−0.051	−0.014	0.001	0.005	0.007	0.016	−0.000	0.038*
Couple's education (ref. Low-level homogamy)	Middle-level homogamy	0.147***	−0.027	0.001	0.020	−0.008	−0.020	−0.071**	−0.043**
	High-level homogamy	0.236***	−0.107**	−0.023	0.003	−0.005	−0.011	−0.054	−0.039
	Hypogamy	0.080	−0.077*	0.029	−0.002	−0.015	−0.002	−0.017	0.004
	Hypergamy	0.168***	−0.095**	0.007	0.046	0.012	−0.035	−0.075**	−0.028
Financial hardship (ref. No financial hardship)		0.036	−0.053	−0.021	0.005	−0.042*	0.026	−0.000	0.050
Year		0.002	0.002	0.000	−0.003**	0.003**	0.001	−0.001	−0.003***
Geographic region (ref. Continental Europe)	Nordic	0.205***	−0.026	0.013	−0.028	−0.066	−0.030	−0.027	−0.041**
	Mediterranean	−0.006	0.011	0.013	0.030	−0.168***	−0.093***	0.151***	0.063*
	Liberal hybrid	0.006	−0.007	−0.020	0.007	−0.085	0.028	0.076	−0.006
	Visegrád	0.192***	0.078*	0.063**	−0.004	−0.176***	−0.094***	−0.045*	−0.014
	Baltic	0.290***	0.054	0.021	−0.004	−0.184***	−0.093***	−0.044	−0.041**
	South-East	0.088	0.044	0.127***	0.059	−0.174***	−0.106***	−0.032	−0.004
Wave 7		0.015	0.008	−0.000	0.027	−0.025	0.012	−0.045*	0.007
Pseudo-R^2		0.232							
N		1022							

Notes: *p < 0.05, **p < 0.01, ***p < 0.001.

Table 4
Multinomial logistic regression, interactions of experiencing a health shock with educational composition of the couple (average marginal effects with standard errors in brackets).

	1	2	3	4	5	6	7	8
	Both spouses FT	Man retires, woman FT	Coordinated retirement	Man FT, woman unstable career	Man FT, woman PT	Man retires or PT, woman PT	Man FT, woman homemaker	Man retires, woman homemaker
Low-level homogamy	−0.148**	0.164***	0.026	−0.036	−0.023	0.022	−0.044	0.039
	(0.054)	(0.046)	(0.032)	(0.027)	(0.035)	(0.031)	(0.030)	(0.020)
Middle-level homogamy	−0.143*	0.123**	0.056	0.017	0.028	0.002	−0.086**	0.002
	(0.059)	(0.044)	(0.033)	(0.034)	(0.029)	(0.023)	(0.033)	(0.020)
High-level homogamy	−0.085	−0.005	−0.010	0.013	−0.007	0.035	0.093	−0.035
	(0.089)	(0.053)	(0.046)	(0.049)	(0.037)	(0.030)	(0.050)	(0.031)
Hypogamy	−0.163**	0.065	0.076*	−0.032	−0.015	0.053*	−0.012	0.028
	(0.062)	(0.040)	(0.034)	(0.032)	(0.028)	(0.027)	(0.041)	(0.032)
Hypergamy	−0.076	0.137**	0.053	−0.029	−0.075*	0.013	−0.022	−0.000
	(0.069)	(0.042)	(0.042)	(0.047)	(0.038)	(0.021)	(0.034)	(0.028)
Pseudo-R^2	0.240							
N	1022							

Notes: The model is controlling for same variables as included in Table 3, controls not reported. *p < 0.05, **p < 0.01, ***p < 0.001.

the results. Table SM1 in the online appendix shows that with including only couples aged 55 or younger, the sample size is reduced to N = 735 but the main findings are unchanged. Second, to test for the sensitivity of the results to period effects, we performed the same analysis while restricting the observation period, first to health shocks occurring after 1979 and then to health shocks occurring after 1989 (Tables SM2 and SM3 in online appendix). The results do not change substantially. Finally, we performed robustness checks whether country regimes modify the association between health shocks and labor market outcomes (Gupta et al., 2015). When interacting the health shock variable with the regime dummy variables, we found no considerable differences across regimes (Table SM4 in online appendix).

5. Discussion and conclusions

In this article, we investigated the associations between health shocks and the combined employment trajectories of couples. Starting from existing research on the effects of health shocks on labor market outcomes, we theorized that from a life-course perspective the reaction of both spouses to a male spouse's health shock depends on past trajectories of specialization in the household, the earnings potential of each spouse, and the possibility and need to continue working to make a living. Relying on rich retrospective life-course data and with the help of sequence and cluster analysis we found eight distinct combined employment trajectories encompassing five years before and five years after the health shock.

Within this variety of employment trajectories, four were statistically significantly related to the experience of a health shock. The largest effect sizes were found for the negative association with being in a trajectory where both spouses continue to work full-time and a positive association with the trajectory where the man exits work while the woman continues working full-time. There were smaller yet statistically significant positive associations with the clusters where both spouses retire around the same time (coordinated retirement) and where the man retires or works part-time while his spouse works part-time. In contrast to previous studies (Acuña et al., 2019; García-Gómez et al., 2013; Jeon and Pohl, 2017), we found no added-worker effects, as we did not see a distinct pattern of female spouses entering the labor market or switching from part-time to full-time employment. The coordinated retirement trajectory could be the outcome of caregiver or joint-leisure effects of a health shock (Johnson and Favreault, 2001).

TT The results indicated that the health shock is predominantly associated with the changes in male spouse's employment and not so much with that of the female spouse, regardless of their shared employment history. Whereas men are more likely to retire, their spouses continue as before, be it in full-time or part-time employment, or as a homemaker. Previous studies have shown redefinitions of roles in case of childbirth (Kühhirt, 2012; Nitsche and Grunow, 2016) and unemployment of the male spouse (Ehlert, 2015). However, according to our analysis, static patterns of specialization within the household, most likely based on decisions made earlier on in the relationship, play a dominant role in predicting the labor market outcomes of the health shock (Juhn and McCue, 2017; Langner, 2015).

One potential explanation for this finding that the risk of health shocks increases with age and the older the couples get, the more difficult it is to change roles in the household. In particular, women who have been outside the labor market or in marginal or part-time jobs for most of their lives will suffer from depreciated human capital and will see little chance to take on a role of breadwinner (Muller et al., 2020). The European welfare states' safety nets may also smoothen the income-effect of illness and work incapacity to the extent that there are no great economic needs for the women to enter the labor market.

Our main research question and hypotheses regard the differences in the association between health shock and employment according to combined education of the couple, as education is related to both potential earnings and opportunity costs as well as opportunities and needs to continue working. The findings for educationally hypogamous and hypergamous couples are in line with expectations that the relative earnings potential of both spouses co-determine the division of work within the household when a health shock occurs. When the man is higher educated than the woman, the couple is less likely to follow a trajectory of two full-time earners. In contrast to Hypothesis H1, we did not find that men in hypogamous couples were more likely to continue to work full-time following a health shock. However, these couples were more likely retire together following a health shock, suggesting that if the male spouse decides or is forced to retire, the low earnings potential of the lower educated woman makes it unnecessary or unattractive for her to continue working, at least full-time.

On the other hand, when the woman is higher educated than her spouse (i.e. hypergamy), she is more likely to continue working while her spouse retires. This is in support of Hypothesis H2. Higher-educated women are likely to be more attached to the labor market and at the same time able to financially support their spouses retiring. The findings for hypogamous and hypergamous couples underline the role of economic inequalities within the household in decisions on labor market participation of both spouses.

In line with Hypothesis H3a, we find that among couples where both spouses have lower or mid-level education, but not among homogamous higher-educated couples, the health shock is negatively related to the trajectory where both spouses continue to work full-time and positively related to the trajectory where the male spouse retires while the woman remains in full-time work. It is likely that the woman needs to continue working to provide for the household, while the man faces obstacles for remaining in work. We did not find support for Hypothesis H3b that proposed that in higher-educated homogamous couples men are more likely to reduce and women more likely to maintain work effort. The findings suggest exacerbating inequalities between lower- and higher-educated homogamous couples following a health shock: lower educated are more likely to have lower earnings in the first place and have less room for maneuver to adjust to the shock. However, their household income will further decrease when one earner retires.

Due to the complex nature of the life course and the difficulties of adequately capturing it in data and analysis, there are some limitations to this study. First, the selection of couples is not unproblematic. For obvious reasons we were able to only include those couples where the man survived the health shock. There are socioeconomic differences in the chances of surviving a health shock. Moreover, we only included couples that stayed together after the health shock and until the date of the interview, while the risk of divorce could be higher after suffering from a health shock.

Second, our data relies on interviewees' memory of the past events and their timing. However, as we focus on major health shocks, it is likely that respondents have more accurate memory of their timing than smaller fluctuations in health. The data also lacks information on past earnings and exact hours worked. It is possible that adjustments in work happen at the intensive margin, i.e. hours worked, rather than at the extensive margin, i.e. being employed or not. The crude distinction between full-time and part-time employment does not capture smaller changes in working time or taking up less-demanding jobs. Future research could address these issues.

Third, the relationship between health and socioeconomic status is complex: individuals of lower socioeconomic status are more likely to suffer from poor health, poor health can lead to lower socioeconomic status, and furthermore, poor health can have more deleterious impacts among those with scarce resources. While we focus on sudden health shocks, it is possible that they have been preceded by other health problems and unhealthy behavior, which are likely to affect employment trajectories already before the health event studied here. Therefore, strict causal claims cannot be made based on our analysis and the possibility of reverse causality cannot be ruled out.

Fourth, we have focused on male spouses' health shocks due to practical reasons described in the introduction. Consequently, the

gendered patterns of employment within couples are not examined. This is an important research topic for future studies on health, care, labor market participation, and inequality.

Despite these limitations, the study offers a life course perspective on the impact of health shocks on labor market participation and the socioeconomic disparities therein. Although couples are relatively "stuck" in their shared trajectories and even the disruptive event of a health shock does not necessarily create a turning point for all, this study illustrates how opportunities and restrictions for labor market participation within couples are interdependent and subject to the household's combined economic resources. Opportunities and restrictions created within couples could play a role in how inequalities grow between couples and how advantage and disadvantage accumulate across the life course (DiPrete and Eirich, 2006). Therefore, an individual approach to research on the social and economic outcomes of health shocks benefits from adding the couple's perspective.

Credit author statement

Aart-Jan Riekhoff: Conceptualization, Methodology, Formal analysis, Investigation, Writing, **Maria Vaalavuo**: Conceptualization, Methodology, Writing

Acknowledgements

This study uses data from SHARE Waves 2, 3, 4 and 7 (DOIs: 10.6103/SHARE.w2.710, 10.6103/SHARE.w3.710, 10.6103/SHARE.w4.710, 10.6103/SHARE.w7.710), see Börsch-Supan et al. (2013) for methodological details. In addition, this study uses data from the generated Job Episodes Panel (doi:10.6103/SHARE.jep.710), see Brugiavini et al. (2019a) for methodological details. For further details see www.share-project.org. The authors would like to thank Katja Möhring for extensive commenting at earlier stages of drafting the manuscript. Maria Vaalavuo received funding from the Academy of Finland INVEST flagship project, decision number: 320162.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.socscimed.2021.113843.

References

Abbott, A., 1995. Sequence analysis: new methods for old ideas. Annu. Rev. Sociol. 21, 93–113. https://doi.org/10.1146/annurev.so.21.080195.000521.

Acuña, C., Acuña, H., Carrasco, D., 2019. Health shocks and the added worker effect: a life cycle approach. J. Appl. Econ. 22, 273–286. https://doi.org/10.1080/15140326.2019.1613089.

Aisenbrey, S., Fasang, A.E., 2010. New life for old ideas: the "second wave" of sequence analysis bringing the "course" back into the life course. Socio. Methods Res. 38, 420–462. https://doi.org/10.1177/0049124109357532.

Becker, G.S., 1985. Human capital, effort, and the sexual division of labor. J. Labor Econ. 3, S33–S58. https://doi.org/10.1086/298075.

Bertogg, A., Strauß, S., Vandecasteele, L., 2020. Linked lives, linked retirement? Relative income differences within couples and gendered retirement decisions in Europe. Adv. Life Course Res. 100380. https://doi.org/10.1016/j.alcr.2020.100380.

Braakmann, N., 2014. The consequences of own and spousal disability on labor market outcomes and subjective well-being: evidence from Germany. Rev. Econ. Househ. 12, 717–736. https://doi.org/10.1007/s11150-012-9164-7.

Breen, R., Salazar, L., 2011. Educational assortative mating and earnings inequality in the United States. Am. J. Sociol. 117, 808–843. https://doi.org/10.1086/661778.

Brugiavini, A., Orso, C.E., Genie, M.G., et al., 2019a. Combining the Retrospective Interviews of Wave 3 and Wave 7: the Third Release of the SHARE Job Episodes Panel. *SHARE Working Paper Series*, no. 36-2019. https://arca.unive.it/retrieve/handle/10278/3711743/159173/WP_Series_36_2019_Brugiavini.pdf.

Brugiavini, A., Orso, C.E., Genie, M.G., et al., 2019b. SHARE Job Episodes Panel. Release version: 7.1.0. https://doi.org/10.6103/SHARE.jep.710.

Börsch-Supan, A., 2019a. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 3. Release version: 7.1.0. https://doi.org/10.6103/SHARE.w3.710.

Börsch-Supan, A., 2019b. Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 7. Release version: 7.1.0. https://doi.org/10.6103/SHARE.w7.710.

Börsch-Supan, A., Brandt, M., Hunkler, C., et al., 2013. Data resource profile: the survey of health, ageing and retirement in Europe (SHARE). Int. J. Epidemiol. 42, 992–1001. https://doi.org/10.1093/ije/dyt088.

Coile, C.C., 2004. Health Shocks and Couples' Labor Supply Decisions. NBER Working Paper, no. 10810. https://doi.org/10.3386/w10810.

Dannefer, D., 2003. Cumulative advantage/disadvantage and the life course: cross-fertilizing age and social science theory. J. Gerontol. B Psychol. Sci. Soc. Sci. 58, S327–S337. https://doi.org/10.1093/geronb/58.6.S327.

DiPrete, T.A., Eirich, G.M., 2006. Cumulative advantage as a mechanism for inequality: a review of theoretical and empirical developments. Annu. Rev. Sociol. 32, 271–297. https://doi.org/10.1146/annurev.soc.32.061604.123127.

DiPrete, T.A., McManus, P.A., 2000. Family change, employment transitions, and the welfare state: household income dynamics in the United States and Germany. Am. Socio. Rev. 65, 343–370. https://doi.org/10.2307/2657461.

Ehlert, M., 2015. Couples' strategies after job loss in West Germany and the United States – the added worker effect and linked life courses. Schmollers Jahrb. 135, 55–65. https://doi.org/10.3790/schm.135.1.55.

Elder, G.H., Johnson, M.K., Crosnoe, R., 2007. The Emergence and Development of Life Course Theory. Handbook of the Life Course. Springer, Boston, MA.

Fadlon, I., Heien Nielsen, T., 2019. Family health behaviors. Am. Econ. Rev. 109, 3162–3191. https://doi.org/10.1257/aer.2017199.

Gabadinho, A., Ritschard, G., Studer, M., et al., 2011. Mining Sequence Data in R with the TraMineR Package: A User's Guide. http://mephisto.unige.ch/pub/TraMineR/doc/TraMineR-Users-Guide.pdf.

García-Gómez, P., Van Kippersluis, H., O'Donnell, O., et al., 2013. Long-term and spillover effects of health shocks on employment and income. J. Hum. Resour. 48, 873–909. https://doi.org/10.3368/jhr.48.4.873.

Gauthier, J.-A., Widmer, E.D., Bucher, P., et al., 2010. Multichannel sequence analysis applied to social science data. Socio. Methodol. 40, 1–38. https://doi.org/10.1111/j.1467-9531.2010.01227.x.

Goñalons-Pons, P., Schwartz, C.R., 2017. Trends in economic homogamy: changes in assortative mating or the division of labor in marriage? Demography 54, 985–1005. https://doi.org/10.1007/s13524-017-0576-0.

Gupta, N.D., Kleinjans, K.J., Larsen, M., 2015. The effect of a severe health shock on work behaviour: evidence from different health care regimes. Soc. Sci. Med. 136, 44–51. https://doi.org/10.1016/j.socscimed.2015.05.008.

Helske, S., Helske, J., 2019. Mixture hidden Markov models for sequence data: the seqHMM package in R. J. Stat. Software 88 (3), 1–32. https://doi.org/10.18637/jss.v088.i03.

Jeon, S.-H., 2017. The long-term effects of cancer on employment and earnings. Health Econ. 26, 671–684. https://doi.org/10.1002/hec.3342.

Jeon, S.-H., Pohl, R.V., 2017. Health and work in the family: evidence from spouses' cancer diagnoses. J. Health Econ. 52, 1–18. https://doi.org/10.1016/j.jhealeco.2016.12.008.

Jiménez-Martín, S., Labeaga, J.M., Vilaplana Prieto, C., 2006. A sequential model of older workers' labor force transitions after a health shock. Health Econ. 15, 1033–1054. https://doi.org/10.1002/hec.1163.

Johnson, R.W., Favreault, M., 2001. Retiring Together or Working Alone: the Impact of Spousal Employment and Disability on Retirement Decisions. Center for Retirement Research Working Papers, no. 2001-1. https://doi.org/10.2139/ssrn.265143.

Juhn, C., McCue, K., 2017. Specialization then and now: marriage, children, and the gender earnings gap across cohorts. J. Econ. Perspect. 31, 183–204. https://doi.org/10.1257/jep.31.1.183.

Killewald, A., Gough, M., 2013. Does specialization explain marriage penalties and premiums? Am. Socio. Rev. 78, 477–502. https://doi.org/10.1177/0003122413484151.

Kridahl, L., Kolk, M., 2018. Retirement coordination in opposite-sex and same-sex married couples: evidence from Swedish registers. Adv. Life Course Res. 38, 22–36. https://doi.org/10.1016/j.alcr.2018.10.003.

Kröger, H., Pakpahan, E., Hoffmann, R., 2015. What causes health inequality? A systematic review on the relative importance of social causation and health selection. Eur. J. Publ. Health 25, 951–960. https://doi.org/10.1093/eurpub/ckv111.

Kühhirt, M., 2012. Childbirth and the long-term division of labour within couples: how do substitution, bargaining power, and norms affect parents' time allocation in West Germany? Eur. Socio Rev. 28, 565–582. https://doi.org/10.1093/esr/jcr026.

Langner, L.A., 2015. Within-couple specialisation in paid work: a long-term pattern? A dual trajectory approach to linking lives. Adv. Life Course Res. 24, 47–65. https://doi.org/10.1016/j.alcr.2015.02.002.

Lesnard, L., 2010. Setting cost in optimal matching to uncover contemporaneous socio-temporal patterns. Socio. Methods Res. 38, 389–419. https://doi.org/10.1177/0049124110362526.

Lundborg, P., Nilsson, M., Vikström, J., 2015. Heterogeneity in the impact of health shocks on labour outcomes: evidence from Swedish workers. Oxf. Econ. Pap. 67, 715–739. https://doi.org/10.1093/oep/gpv034.

Mize, T.D., 2019. Best practices for estimating, interpreting, and presenting nonlinear interaction effects. Sociol. Sci. 6, 81–117. https://doi.org/10.15195/v6.a4.

Muller, J.S., Hiekel, N., Liefbroer, A.C., 2020. The long-term costs of family trajectories: women's later-life employment and earnings across Europe. Demography 1–28. https://doi.org/10.1007/s13524-020-00874-8.

Nitsche, N., Grunow, D., 2016. Housework over the course of relationships: gender ideology, resources, and the division of housework from a growth curve perspective. Adv. Life Course Res. 29, 80–94. https://doi.org/10.1016/j.alcr.2016.02.001.

Rönkä, A., Oravala, S., Pulkkinen, L., 2003. Turning points in adults' lives: the effects of gender and the amount of choice. J. Adult Dev. 10, 203–215. https://doi.org/10.1023/A:1023418414709.

Settersten Jr., R.A., 2015. Relationships in time and the life course: the significance of linked lives. Res. Hum. Dev. 12, 217–223. https://doi.org/10.1080/15427609.2015.1071944.

Studer, M., 2013. WeightedCluster Library Manual: A Practical Guide to Creating Typologies of Trajectories in the Social Sciences with R. https://cran.r-project.org/web/packages/WeightedCluster/vignettes/WeightedCluster.pdf.

Trevisan, E., Zantomio, F., 2016. The impact of acute health shocks on the labour supply of older workers: evidence from sixteen European countries. Lab. Econ. 43, 171–185. https://doi.org/10.1016/j.labeco.2016.04.002.

Vaalavuo, M., 2016. Deterioration in health: what is the role of unemployment and poverty? Scand. J. Publ. Health 44 (4), 347–353. https://doi.org/10.1177/1403494815623654.

Vaalavuo, M., 2021. The unequal impact of ill health: earnings, employment, and mental health among breast cancer survivors in Finland. Lab. Econ. 69, 1–14. https://doi.org/10.1016/j.labeco.2021.101967.

Visser, M., Fasang, A.E., 2018. Educational assortative mating and couples' linked late-life employment trajectories. Adv. Life Course Res. 37, 79–90. https://doi.org/10.1016/j.alcr.2018.04.005.

Wu, S., 2003. The effects of health events on the economic status of married couples. J. Hum. Resour. 38, 219–230. https://doi.org/10.3368/jhr.XXXVIII.1.219.