

Chapter 14

Work Disability and Divorce



Daniel Brüggmann

Introduction

Research has suggested that married people enjoy better mental and physical health than their divorced peers (Williams et al. 2008). The explanations for this pattern refer to two different (but not necessarily mutually exclusive) modes of action between the state of health and the event of divorce. The social causation argument posits that changes associated with divorce or separation have a negative impact on health (Wade and Pevalin 2004). According to this logic, experiences typically associated with divorce – such as having to adapt to the loss of the spouse, a deterioration in living standards, the disruption of social networks, the loss of social support, and having to bear the double burden of single parenting and employment – are detrimental to health and/or are promote unhealthy behaviours. The literature has also posed the question of whether these effects are of a short-term nature (i.e., individuals become accustomed to their new conditions) or are longer lasting (Couch et al. 2015; Tamborini et al. 2016). The social selection argument states that with declining health, the quality of a couple’s marriage decreases and their risk of divorce increases (Goldman 1993; Wade and Pevalin 2004). According to this logic, the effects of a divorce should be minor, and the relatively poor health observed among people who are divorced is a consequence of selection.

In this chapter, we use register data from the statutory German pension fund to examine the health consequences of divorce in West Germany. The outcome of interest is the uptake of work disability, which is defined as sick leave starting after 6 weeks of illness. Work disability is an important measure because at an individual level, taking work disability limits the scope of an individual’s labour market participation, and reduces his/her income. Taking extended periods of sick leave might

D. Brüggmann (✉)
Hertie School, Berlin, Germany
e-mail: d.brueggmann@phd.hertie-school.org

also significantly reduce a worker's retirement income, and lead to social isolation, depression, and low self-esteem. At the macro level, work disability claims create public costs in the form of sick pay, medical expenses, rehabilitation costs, lost working days, and reduced productivity. The aim of this study is twofold. First, we provide easily accessible statistics that illustrate how the likelihood of taking work disability leave changes around divorce. Second, we examine the question of whether individuals' health status after divorce is partially related to selection into divorce. As a method, we employ the nearest neighbor matching approach, which allows us to generate a comparable control group for the divorced population. We have restricted the analysis to West German men and women who separated between 2000 and 2010. We analyse men and women separately. For women, we differentiate between mothers and childless women, as we assume that divorce weighs more heavily on the health status of mothers than of childless women.

Theoretical Considerations

Benefits of Marriage

Apart from the reasonable assumption that healthier and wealthier individuals are privileged in the partner market – i.e., that those individuals might be more likely to select into marriage – marriage is found to improve health (Lillard and Panis 1996) and material well-being (Wilmoth and Koso 2002). Material well-being increases because married couples benefit from economies of scale by sharing housing, food, and utilities. Sharing resources minimises the partners' cost of living and provides them with insurance against unexpected events, like unemployment or illness (Wilmoth and Koso 2002). Moreover, in some countries, including in Germany, marriage can provide institutional support that is not available to non-married individuals, like free health insurance for spouses or tax benefits. Thus, on average, married couples have lower poverty rates and more assets than their unmarried counterparts. These effects of marriage are usually assumed to reduce stress and to increase security, which may, in turn, have positive effects on health. Additionally, marriage provides a healthy social environment that inhibits individuals from engaging in self-destructive acts; i.e., a married person is more likely than a single person to have someone in his/her life who regulates his/her behaviour, either by imposing sanctions or by causing the person to internalise norms that encourage conventional behaviour (Umberson 1987). For these reasons, marriage has been found to be one of the most important categories of social ties that help to buffer people from the effects of negative life events (Umberson 1987).

Although marriage offers a range of socio-emotional and economic resources that can enhance the partners' health and well-being, the benefits of marriage for a given individual depend on the person's gender, socio-demographic characteristics, and relationship characteristics. Compared to men, women seem to gain more from

marriage in material terms, and but are less likely to rely exclusively on their partner for emotional support (Williams et al. 2008). In contrast, compared to women, men are less likely to benefit from marriage economically, but are more likely to rely on their partner for emotional support and social integration (Gerstel et al. 1985). The benefits of marriage also depend on the duration and the timing of the marriage. There is evidence that marriage duration is correlated with longevity. However, it has also been shown that the benefits of marriage are diminished if the partners form the union while very young, because early marriage tends to be associated with reduced financial resources and greater marital distress (Dupre et al. 2009). In particular, marital distress has been found to counteract the protective effects of marriage, as conflict-ridden marriages are associated with emotional loneliness, drinking, and depression (Waite 1995; Dykstra and Fokkema 2007; Umberson et al. 2006).

To sum up, marriage seems to provide the partners with financial resources and social support that promotes health by either reducing their economic uncertainty or prompting them to adopt a healthier lifestyle. Conversely, men and women who are experiencing marital disruption tend to have substantially higher stress levels, worse subjective well-being, a higher risk of drinking, and lower body weight (Waite 1995; Umberson 1992). Research has also shown that divorcees have an elevated risk of psychiatric illness, suicide, motor vehicle accidents, homicide, physical illness, and misuse of various substances; and tend to report higher levels of depression, anxiety, and unhappiness (Booth and Amato 1991). In general, it seems that compared to married people, divorcees are more likely to engage in negative health behaviours, and are less likely to have an orderly lifestyle. These unpleasant outcomes are addressed in the “divorce-health” literature, and are condensed in the social causation framework.

Health Consequences of Divorce

The “divorce-health” literature has shown that separation and divorce are stressful events with adverse effects on health. There are many reasons why divorce has a negative impact on health, but among those that are mentioned most frequently are that divorcees often experience a deterioration in living standards, a change in residence, the disruption of their social networks, the loss of social support, and the pressure to take on the double burden of single parenting and employment. The stress associated with these changes and with the loss of a partner seem to promote unhealthy behaviours, which, in turn, increases the risk of poor health and mortality (Zhang and Hayward 2006). Divorcees are especially likely to report symptoms of poor mental health, in part because a divorce can lead to the loss of supportive social networks, and force them to reorganise their network outside of their marriage. Moreover, the networks people build after a divorce are often not of the same quality as the networks they had while married. It has, for example, been shown that divorcees’ new networks are often burdensome, and may undermine their health,

rather than supporting it (Gerstel et al. 1985). There is, however, evidence that women are better than men at developing new networks and maintaining their ties (Gerstel et al. 1985). The differences in the network structures of men and women might also be responsible for their different health outcomes after divorce. To the extent that network size and quality correlates with loneliness, the greater decline in social support found among men than among women could mean that for men, divorce has especially negative effects on their levels of social control and lifestyle choices. Shor et al. (2012) suggested that the risk of death is higher for divorced men than for divorced women because men are more likely to experience a substantial decline in social support. Similarly, Umberson (1987) found that men suffer more than women from the loss of social control, which may cause them to develop drinking problems. By contrast, compared to their male counterparts, divorced women are more prone to experiencing financial strain, and having a lower household income coupled with increased parental responsibilities increases the likelihood of having poor mental health. Although men also frequently have a lower household income after a divorce, men's income losses tend to be smaller than those of women (Andrefß and Bröckel 2007; see also Mortelmans, Chap. 2 in this volume). Research on the impact of the time that has elapsed since the union dissolution on the well-being of divorcees has shown that the negative consequences of divorce are most pronounced around the time of the event itself, and then usually attenuate and lose their effect. It has, for example, been found that getting divorced more than doubles mortality for men (133%) and women (132%) in the first 2 years after the divorce, but that this effect peters out in later years (Brockman and Klein 2004). Having been recently divorced has also been shown to be associated with lower life satisfaction for men and women. It appears, however, that this effect is stronger for men than for women, as women tend to have smaller reductions in life satisfaction, and generally return to their baseline values more quickly (Leopold and Kalmijn 2016). However, while some of the negative consequences of divorce seem to be short-lived or to diminish over time, there is also evidence that divorce can have long-term consequences. Divorce has been linked to an increased cumulative probability of taking work disability leave and of receiving disability benefits for many years after the divorce (Couch et al. 2015; Tamborini et al. 2016). These results strengthen the view that life-changing events can lead to cumulative health strains that emerge slowly.

Selection into Divorce

While the “divorce-health” literature has highlighted the stressful nature of divorce, the “health-divorce” literature has pointed out that poor health, psychological problems, and financial hardship increase the risk of divorce (Fu and Goldman 2000; Wade and Pevalin 2004). Hence, the often-observed poor health condition of divorcees is not necessarily attributable to the event itself, but may instead be a result of selection. If the decline in a spouse's health leads to constraints in his/her everyday

functioning, the healthy spouse might have to take over more of the cleaning, cooking, maintenance, and childcare (Booth and Johnson 1994). The change in the division of household tasks may be a source of marital unhappiness. The persisting poor health of one of the partners might also lead to a reduction in the couple's shared activities, changes the set of assumptions the marriage was based on, and a reduction in family income that increases financial stress (Teachman 2010). These shifts might, in turn, lead to a renegotiation of marital tasks, a reduction in the benefits of marriage for the healthy spouse, and an increased risk of divorce (*ibid.*).

The assumption that one of the spouses being in poor health worsens the quality of the marriage may be overly pessimistic. The poor health of one of the spouses might also be perceived as a common experience with the power to strengthen the couple's existing bonds. Syse and Kravdal (2007), for example, have found that a spouse having an illness like cancer does not necessarily increase the risk of divorce, and may even reduce it. However, this result might be driven by the normative pressure not to leave a seriously ill partner, or by the rationale that leaving a seriously ill spouse might not make sense if death is anticipated (Syse and Kravdal 2007).

To the extent that social selection precedes separation, any measured health consequence after divorce cannot be linked directly to divorce, because divorcees are then a selected group in especially poor or especially good health. The "health-divorce" literature has provided support for the selection argument, with one study showing that some of the excess mortality and health problems observed among divorcees result from a health-related selection process out of marriage (Fu and Goldman 2000). Another study found that work-related health limitations are associated with marital instability rather than the reverse, but this result referred only to the health of the husband, and not to the health of the wife (Teachman 2010). These results are in line with the findings of Yorgason et al. (2008): i.e., that when a wife's health declines, the husband is more likely to report a decline in marital happiness; but that when the husband's health declines, the wife is more likely to report not only a decline in happiness, but increases in disagreement levels, marital problems, and divorce proneness (Yorgason et al. 2008).

To sum up, the "divorce-health" literature provides evidence that divorce has an impact on health, and the "health-divorce" literature provides evidence of a selection into divorce due to poor health. Both frameworks are important, and need to be addressed in the empirical investigation.

Data and Analytical Approach

Data and Analytical Sample

In the present study, we used linked data from the statutory German pension system. We linked the records of the Sample of Active Pension Accounts (VSKT) with the records of the Pension Rights Adjustments Statistic (EHRCYSY). The VSKT is a

random sample of individuals with a pension account. It provides detailed pension-relevant information, such as information on the individuals' employment and earnings history, spells of parental leave, and childbirths (Stegmann and Himmelreicher 2008). The EHRCSY contains the dates of separation and divorce (Keck and Mika 2016). The pension fund collects these data, because Germany has a system of "income splitting", whereby pension entitlements are split after divorce (for more details, see Keck et al. 2017). The great advantage of using these data is that they provide us with a reasonably large sample size. Unlike prospective survey data, register data do not suffer from attrition, which is especially likely to occur after a separation or a divorce. However, there are other caveats that we need to mention. One limitation of the data is that the register data do not include the full resident population, but cover only those who have a pension account. About 90% of the resident population are included in the data, but people in certain professions, such as civil servants and farmers, are not included (Kruse 2007). Furthermore, not all divorces are included in the data because the register data only contain information on divorces that result in pension splitting. Pension splitting is, in theory, mandatory, but certain couples – and particularly those with short marriages – can avoid pension splitting (Keck et al. [forthcoming](#)). Thus, the observed divorcees might not be a representative subpopulation of all divorcees in Germany.

The analytical sample consists of individuals who separated between 2000–2010. Separation (t_0) is defined as the year that the divorce file was opened; i.e., the year when the defendant received the divorce petition.¹ In the following, we use the term "divorce" to refer to the date the file was opened to make the text easier to read. Note, however, that a divorce may not be legally finalised until months or even years after the file was opened. We restricted the analysis to individuals living in West Germany, who are persons who have never worked in the Eastern states of Germany. East Germany was excluded, in part because the case numbers were low, especially for childless women; and in part because there are considerable differences between the two parts of Germany in terms of female labour market participation and marriage and divorce patterns. We have furthermore limited the investigation to the time window of 7 years before the separation up to 4 years after the separation. Thus, we followed individuals from t_{-7} to t_{+4} . We chose t_{-7} to address separation and the anticipation of separation, and to properly isolate prior health selection (see, for example, Johnson and Skinner (1986) for changes in labour market participation). The choice of t_{+4} was driven by constraints in the data availability for the most recent years. We organised the data as a person-year dataset. Thus, each individual contributes several years of data to the investigation. We furthermore restricted the sample to individuals who were divorced for the first time and who were married at the beginning of the observation period in t_{-7} . Thus, shorter marriages are not included in this investigation. Time is defined as the exact time since separation. The final sample includes 4467 men and 6192 women (see Table 14.1). The subsamples of

¹ Instead of calendar year, we defined years by the exact time since divorce. If the divorce file was opened in, for example, April 2003, then t_0 spans the period 16 April 2002 to 15 April 2003; and t_{-1} is from 16 April 2001 to 15 April 2002; and so on.

Table 14.1 Covariate mean values before and after four nearest neighbour matching at t_{-7}

Variable	Men		Women		Women with children		Women without children	
	Divorced	Control	Divorced	Control	Divorced	Control	Divorced	Control
Foreign citizenship	Raw	0.30	0.58	0.32	0.29	0.39	0.40	0.62
	Matched	0.30	0.30	0.32	0.32	0.30	0.40	0.40
Age	Raw	35.3	30.4	32.6	33.7	37.9	31.2	27.8
	Matched	35.3	35.5	32.6	33.0	33.8	31.2	31.4
Number children <3	Raw			0.310	0.089	0.279		
	Matched			0.310	0.298	0.392		
Number children 3–6	Raw			0.280	0.083	0.261		
	Matched			0.280	0.278	0.357		
Number children >6	Raw			0.883	0.454	1.425		
	Matched			0.883	0.921	1.144		
Parental leave	Raw			199.9	43.2	135.1		
	Matched			199.9	195.2	258.2		
Unemployment rate	Raw	9.06	9.04	9.04	9.04	9.05	9.08	9.04
	Matched	9.06	9.07	9.04	9.04	9.02	9.08	9.06
Employment	Raw	4094	1627	1940	1416	2731	2063	839
	Matched	4094	4104	1940	2042	2057	2063	2093
Earnings employment	Raw	12.21	4.67	3.66	2.80	5.07	4.32	1.84
	Matched	12.21	12.15	3.66	3.88	3.83	4.32	4.39
Military service	Raw	132	63					
	Matched	132	135					
Vocational training	Raw	480	184	363	180	260	315	102
	Matched	480	469	363	359	364	315	307
N	Raw	4467	165,621	6192	154,269	49,187	729	80,246
	Matched	4467	15,104	6192	19,333	14,030	729	2757

Notes: Further matching variables were: year and month the file was opened, age squared, employment, and earnings squared

mothers and childless women consist of 4826 and 729 women, respectively. The numbers do not sum up to 6192 because the mothers were women who already had children in t_{-7} , and the childless women were childless until t_{+4} . The women who gave birth between t_{-7} and t_{+4} account for the remaining difference.

Analytical Approach

The aim of this study is to describe the work disability uptake pattern around separation by comparing the health status of divorcees to the health status of an appropriate control group. In order to design a control group, we relied on matching techniques. The use of matching techniques was necessary because the characteristics of the people who did not undergo a divorce differed sharply from the characteristics of the divorcees. This becomes clear when looking at Table 14.1, which compares the socio-demographic characteristics of the “raw sample” and the “matched sampled” (see the row “matched” and “raw”). The most important aim of matching is to exclude all of the individuals from the control group who are not similar to the individuals from the divorced group.

For our purposes, we relied on four nearest neighbour matching, with the common support restriction and a caliper of 0.02 (i.e., we chose only individuals from the comparison group whose propensity scores did not differ by more than ± 0.02). All of the individuals from the control group who were not a valid “neighbour” were deleted, and have not been included in our analysis. The lines marked “matched” in Table 14.1 show the mean values for the selected covariates after matching, and demonstrate that dropping the non-comparable resulted in a much more balanced control sample. Additionally, in Table 14.3 in the Appendix, we provide further details of our matching procedure. These findings suggest that after matching, the two groups (divorced and control sample) were highly comparable. Obviously, we could only match on observable characteristics; which means that unobserved factors could still bias our investigation. Finally, as the people in the control group obviously did not have a date of divorce, we had to randomly assign them a date of divorce.

In the first step of the investigation, we display sample statistics at the start of the observation period (t_{-7}) and at the end of the observation period (t_{+4}). We also provide the mean values of our key dependent variables (the cumulated days of work disability and the yearly work disability rate) for these two time points. The second step of the investigation contains a pooled OLS-regression analysis. Here, we use the person-year data that was pooled over the entire observation period. We interact a dummy for the control group with our time variable (t_{-7} to t_{+4}) to illustrate how disability changes around divorce. All of these analyses are done separately for men and women. For women, we also conduct a separate analysis for mother and childless women.

Variables

Health is defined based on an individual's history of work disability. It is important to note that this term refers only to long-term disability, because the pension data only includes information on work disability if the individual or the employer was paying social security contributions to the pension system. During the first 42 days of illness, employees in Germany are entitled to sick pay benefits that cover their full income. After 42 days of illness, employees are entitled to receive a reduced sickness benefit that usually amounts to 70% of their former income, and that is recorded in the pension data. There are two other important shortcomings in our data that pertain to the outcome variable. The outcome variable may be biased upwards because sick pay for children is also included in the pension data, and is recorded from the first day of sickness. The uptake of sick pay for children is, however, very low in Germany. Analyses of health data have shown that the sick pay days for children account for less than 2% of all recorded sick pay days, and those days that are recorded are mainly granted for mothers (> 85%) and very rarely for fathers (< 15%) (Sondergutachten 2015). While children's sick days bias the absolute values upwards, the outcome variable does not include the health impairments of unemployed and non-working individuals, which biases the absolute days of sick leave downwards. This aspect has to be taken into account when we discuss the absolute values of sick leave. However, our interest is less in the absolute number of disability days taken. Instead, the analysis compares the work disability days taken by divorcees and a control group. Thus, the difference is of greater interest than the absolute values (see below).

We use two outcome variables for this investigation:

- The main variable of interest is the **cumulated days of work disability**. This variable was constructed by cumulating the number of work disability days taken since age 15.
- The yearly **work disability rate**. It was calculated by the number of work disability days taken in the respective year divided by 365.

We used several socio-demographic variables in matching the control group. These variables are also employed later in the OLS regression. We controlled for German **citizenship**, distinguishing between German citizens and persons with foreign citizenship. We included **age** (and squared) in years to account for different health risks across the life course. We controlled for the **unemployment rate** in West Germany, because the uptake of work disability correlates with times of recessions and prosperity (Benítez-Silva et al. 2010). We also used **cumulated days in employment with social security contributions** (and squared), because employment is a protective factor against the economic risk of marriage dissolution, as well as a source of self-esteem and social support.² For a woman, being employed may increase her economic independence, thereby lowering her exit costs. Thus, a

²Cumulated covariates accumulate the outcome from age 15 up to the respective year.

woman's employment could make it easier for her to dissolve an unsatisfactory, conflict-ridden marriage. Moreover, a woman's employment might increase her psychological independence and strengthen her belief that she is competent and capable of establishing an independent household (Kalmijn and Poortman 2006). We also accounted for **cumulated earnings** (and squared). Earnings are measured in individual pension points. An individual earns one pension point if the yearly gross income equals the average gross income in West Germany of the respective year. We also added **cumulated days of vocational training** to the models as a proxy for education. The **month and the year the divorce file was opened** was included to control for seasonality. We controlled for the **number of children**, because the presence of children increases a family's economic needs and stress. We controlled for **cumulated days in parental leave** to account for how soon after childbirth the women returned to the labour market. This variable might reflect financial necessity or a desire to participate in the labour force. The latter two variables were only available for the women, and are thus used only for the analysis of the women. For the men, time spent in military service was also included.

Descriptive Findings

Table 14.1 gives an overview of the selected baseline covariates at the beginning of our observation period at t_{-7} . We display their mean values before (raw) and after matching (matched). We can see that the average age of the men in the matched sample was approximately 35.5 years at t_{-7} . The men had accumulated up to that date roughly 4100 days in employment with social security contributions. The days spent in military service are less relevant, and mainly refer to days spent in basic military service. The women were, on average, younger than the men, and had accumulated only half of the men's lifetime employment. The income (measured in earning points) of the average woman was roughly one-third of the income accumulated by the average man. This finding suggests that the women earned less and were less likely to be in full-time employment than the men. On average, the mothers were 1 year older and the childless women were 1 year younger than all of the women in the sample. The mothers and the childless women both accumulated roughly 2000 days in employment; thus, the labour market participation and income levels of childless women were higher. At t_{-7} , the mothers had, on average, at least one child over age six.

Table 14.2 provides summary statistics for the outcome variables for t_{-7} and t_{+4} . The upper panel of the table shows the cumulated days of work disability. Looking at the table, we first note that the number of cumulated work disability days was much lower for the women than for the men. It is, however, important to consider that the lifetime employment participation of the men was twice that of the women. On average, a divorced man had accumulated 32 work disability days at t_{-7} . Four years after the divorce, the value has increased to 79 days. In relative terms, this represented an increase of 146%. For the control group, we observe an increase of

Table 14.2 Average cumulated days of work disability (in days) and yearly work disability rate (in 100)

	Men		Women		Women with children		Women without children	
	Divorced	Control	Divorced	Control	Divorced	Control	Divorced	Control
Cumulated work disability at t_{-7}	32.2	30.3	17.0	13.8	18.0	14.1	18.0	13.3
Cumulated work disability at t_{+4}	79.1	58.6	36.7	26.7	37.8	28.0	40.8	23.3
Ratio $(t_{+4}) / (t_{-7})$	2.46	1.93	2.16	1.93	2.11	1.98	2.26	1.76
Ratio divorced / control	1.27		1.12		1.06		1.29	
Yearly work disability rate at t_{-7}	0.0096	0.0069	0.0043	0.0039	0.0043	0.0036	0.0052	0.0023
Yearly work disability rate at t_{+4}	0.0114	0.0078	0.0066	0.0041	0.0065	0.0052	0.0094	0.0029
Ratio $(t_{+4}) / (t_{-7})$	1.19	1.13	1.53	1.06	1.51	1.44	1.81	1.28
Ratio divorced / control	1.05		1.45		1.04		1.42	

Notes: Presented are the sample mean values for the cumulated work disability days and the yearly work disability rate. For each individual, the cumulated work disability days are measured since age 15 up to the respective year. T_0 represents the opening of the divorce file. Each individual's yearly work disability rate is measured by the number of work disability days in the respective year divided by 365

only 93%. Thus, the increase in the number of work disability days was 27% higher for the divorced men than for the control group. While similar increases are found for childless women, all of the women and the mothers had substantially smaller increases.

The lower panel displays the yearly work disability rate at t_{-7} and t_{+4} . Note that, in contrast to the cumulated outcome, the yearly focus might be more volatile and prone to outliers. Changing the base year, for example, from t_{-7} to t_{-6} might substantially alter the result. However, comparing t_{+4} with t_{-7} shows that the divorced men had a rate that was 5% higher than that of the control group. The sample of all women had a rate that was 45% higher than that of the control group, and the mothers had the smallest increase.

Regression Results

Cumulated Work Disability

The results from the pooled OLS regression on the matched sample are displayed in Table 14.4 in the Appendix. We do not discuss the effect of the control variables, but instead focus on the effect of the time since separation, which is displayed in a graph. The aim of using the pooled OLS regression is simply to standardise for the covariates applied and to retrieve the net effect; i.e., the net, for example, of ageing, childbirth (women only), and labour market participation. We start with the pattern for the cumulated receipt of work disability benefits. Figure 14.1 displays the

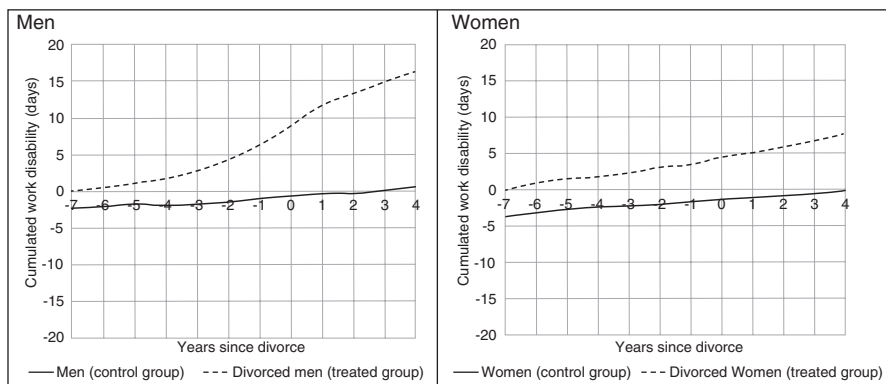


Fig. 14.1 Beta coefficient from the OLS model. Outcome variable: Cumulated days of disability since age 15 (Reference category: Divorced at t_0)

Notes: Pooled OLS models of cumulated work disability days around the time the divorce file was opened. Displayed are the coefficients of group and time interaction from Table 14.4 (Appendix). The control group is chosen by four nearest neighbour matching, with common support and caliper 0.02 at baseline covariates in t_{-7} . Coefficients are shown separately for men and women

pattern for the male and female sample. The slope of the figure for the control group reflects the general trend. As we can see, already at t_{-7} the health of the men and women from the divorced population was worse than that of the control group. At t_{-7} , the difference in all of the accumulated work disability days since age of 15 was 2.3 days for men and 3.7 days for women. These findings strongly support the selection argument, and highlight the importance of controlling for health selection *before* separation. However, we also note that the difference at t_{-7} was statistically significant ($p < 0.01$) for women, but not for men (see Table 14.5, Appendix). Wald tests for the equality of two coefficients show that the control/divorce and time interaction coefficients displayed in Fig. 14.1 were statistically equal for men until t_{-3} , but differed thereafter ($t_{-2} p < 0.05$; t_{-1} to $t_{+4} p < 0.01$). For women, the coefficients were statistically different for all time points ($p < 0.01$) (Table 14.5, Appendix). Given the change between t_{-7} and t_{+4} in the control group and the divorced sample, we calculate a difference-in-difference (DiD) effect of 13.4 days for men ($p < 0.01$) and 4.1 days for women ($p < 0.05$).

Figure 14.2 displays the results for the mothers and the childless women. The figures again show that the divorcees tended to be in poor health before their divorce. Against our expectations, we find that divorce had a greater impact on the health of the childless women than on the health of the mothers, as the curve was much steeper for the childless women than for the divorced mothers. We again calculated a DiD for the period t_{-7} and t_{+4} . We obtained a value of 3.7 days for the mothers and a value of 7.5 days for the divorced women without children. Thus, the increase seems to have been more pronounced for the childless women. However, as the p-values were 0.09 and 0.17, respectively; we have to conclude that neither of the changes was of statistical significance.

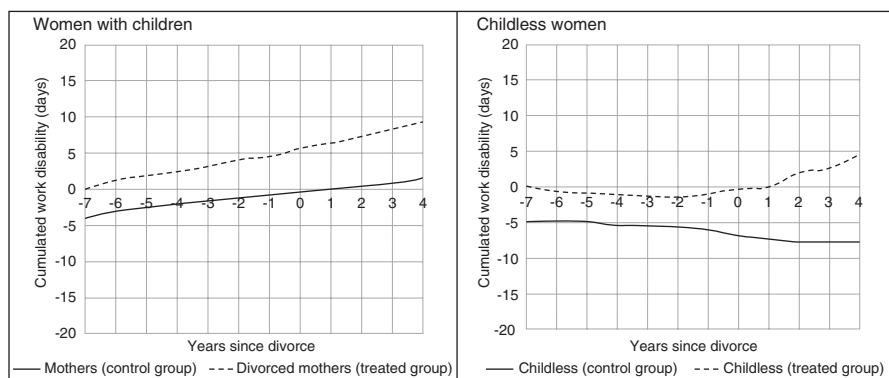


Fig. 14.2 Beta coefficient from the OLS model. Outcome variable: Cumulated days of disability since age 15 (Reference category: Divorced at t_0)

Notes: Pooled OLS models of cumulated work disability days around the time the divorce file was opened. Displayed are the coefficients of group and time interaction from Table 14.4 (Appendix). The control group is chosen by four nearest neighbour matching, with common support and caliper 0.02 at baseline covariates in t_{-7} . Coefficients are shown separately for mothers and childless women.

Work Disability Rate

The analysis of cumulated work disability days revealed that the divorced women were already a select group before their separation. We now display the standardised yearly rate in order to highlight the fluctuation around t_0 . In Fig. 14.3, we display the results for the men and the women. For the mothers and the childless women, the sample sizes are, unfortunately, too small to allow us to conduct an equivalent analysis. The figure shows that the disability rate of the control group was always lower than that of the divorcees. Indeed, it appears that the health status of the control group improved slightly over time. The increase in the disability rate over time can very likely be attributed to a shift in job profiles to the service sector, improvements in workplace security, and better medication and rehabilitation over time. The initial difference between the divorced and the control sample was small, amounting to 0.0027 for the men and to 0.00048 for the women. However, beginning with t_{-4} for the men and t_{-3} for the women, the rates started to dynamically diverge from those of the control group ($p < 0.01$). We interpret this pattern as signalling the beginning of the separation process or the anticipation of the separation. For the men, this process peaked at t_{+1} which coincides with the median date when the divorce was legally finalised. The pattern for the women was more irregular. The disability rate had already peaked at t_0 and had declined considerably at t_{-1} (p-value of 0.35, Table 14.5, Appendix). The results of the analysis suggest that the health of the men (as shown in the pension data) was more affected by divorce than that of the women. We should, however, point out that our approach does not allow for a direct comparison of effect sizes, because we analysed the men and the women separately. The

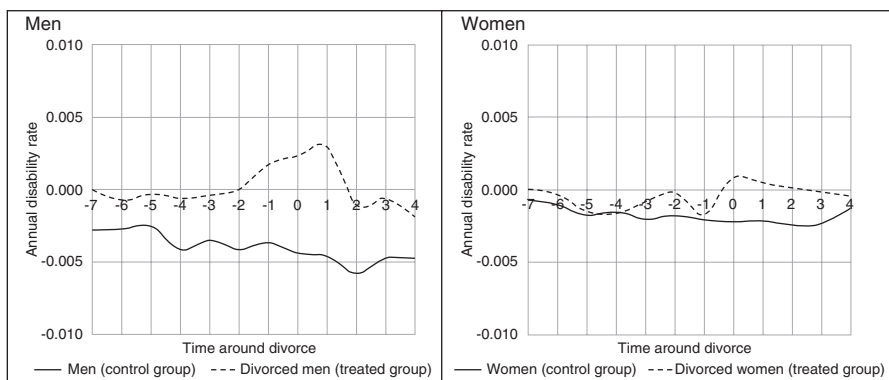


Fig. 14.3 Beta coefficient from the OLS model. Outcome variable: Yearly work disability rate (Reference category: Divorced at t_0)

Notes: Pooled OLS models of the yearly work disability rate around the time the divorce file was opened. Displayed are the coefficients of group and time interaction from Table 14.4 (Appendix). The control group is chosen by four nearest neighbour matching, with common support and caliper 0.02 at baseline covariates in t_{-7} . Coefficients are shown separately for men and women.

effect sizes for the men were greater because most of the men worked full-time. As the women were often working part-time or only marginally, they may have adopted different strategies for coping with health impairments. In addition, many of the women entered employment after their divorce, and may have shied away from taking large numbers of days off for health reasons.

Discussion

Using administrative pension data, this study examined work disability patterns among divorcees in West Germany. We provided an estimate of the effect of divorce on health impairments. We did so by calculating the difference between divorcees and a control group in the uptake of work disability. This value summed up to 13.4 days for the men, 4.1 days for the women, 3.7 days for the mothers, and 7.5 days for the childless women compared to the control group, and holding control variables constant. This increase was, however, statistically significant only for the men and the sample of all of the women. Although our findings suggest that men's health was more affected by divorce than that of women, we want to emphasise that direct comparisons of effect sizes were not possible in our framework. In particular, it is important to keep in mind that most of the men were working full-time, while most of the women were in part-time or marginal work. It is therefore possible that the women were less likely than the men to register as sick with an employer, even if they were grappling with similar health impairments. In addition, many women started working around the time of their divorce. As they had to establish themselves in the labour market, they may have shied away from taking long periods of sick leave. While we could not compare the size of the effect across our subsample, we were able to compare the temporal ordering of divorce and health impairments. The findings indicate that, on average, the women adapted to their new life earlier (peak at t_0), while the men's health did not start to improve until after t_{+1} .

The study also examined health selection. The results of our analysis show that the women, and particularly the mothers, were, at t_{-7} , already showing signs of poor health, as they had four more cumulated work disability days (counted since the age of 15) than a control group with similar baseline characteristics. These values are significant, and seem to support the argument that social selection contributes to the likelihood of a divorce. Thus, our results stress the point made by Fu and Goldman (2000), who observed that if selection is important, then researchers might have been overstating the negative effects of dissolution on health and exaggerating the benefits of marriage. In other words: "... *sample selection temper conclusions about divorce being causal in driving health. The primary argument is that worse health outcomes among the divorced reflect elevated divorce risks among individuals with worse health*" (Couch et al. 2015: 1491).

However, although we found some evidence of selection, we also observed that divorce had a large impact on health status. The findings from this investigation allow us to draw some policy-relevant conclusions. First, we note that the uptake of work disability is an important outcome, because work disability limits the scope of labour market participation and of access to secure income. Spending longer periods in work disability might even reduce an individual's employability, retirement income, and material well-being. As well as having personal costs, long-term disability creates public costs, including the loss of working days and the costs associated with providing sick pay, health services, and rehabilitation services. Our results show that separation and the anticipation of separation had immediate effects on health for all of the subsamples. Thus, we conclude that to ensure that spouses and their children emerge from the divorce process less compromised and healthier, psychological help or mediation services should be made available (Hannighofer et al. 2017).

Finally, there are several caveats to this study. First, the register data do not constitute a full sample of the population. For example, civil servants and farmers are not included. It is possible that these groups behave very differently. Most importantly, our approach was based on a nearest neighbour matching method that relied on the observable covariates in the data. Variables such as psychological disposition, lifestyle factors, and work characteristics were not included in our data, but may be important for understanding health impairments after divorce. Furthermore, to allow for a causal interpretation of our results, more rigorous testing and further sensitivity analysis would be needed.

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Appendix

Table 14.3 Four nearest neighbour matching summary parameter

Mean bias	1.2	2.5	0.8	1.9
Median bias	0.8	2.7	0.9	2.0
Max. difference in propensity score	.002372	.0114435	.0060626	.0004681

Notes: The mean and median bias are summary indicators of the standardised percentage bias. The bias refers to the percent difference of the sample means in the divorced and control sub-samples (for details see Rosenbaum and Rubin 1985)

Table 14.4 Weighted pooled OLS estimation with cumulated work disability and disability rate as the dependent variable over 12 years (t₋₇ to t₊₄)

	Men		Women		Women with children		Childless women	
	Cumulated	Rate	Cumulated	Rate	Cumulated	Rate	Cumulated	Rate
Foreign	1.46	0.000	2.39	0.001	4.76	0.001	-9.67	0.000
Age	-4.24	0.000	-2.96	-0.001	-4.69	-0.001	0.51	0.000
Age ²	0.08	0.000	0.04	0.000	0.05	0.000	0.00	0.000
Year file opening	0.15	0.000	0.06	0.000	0.47	0.000	-0.87	0.000
Month file opening	0.07	0.000	-0.10	0.000	-0.01	0.000	-0.05	0.000
# children < age 3			2.30	0.000	1.39	0.000		
# children age 3-6			2.64	0.000	2.41	0.000		
# children > age 6			2.75	0.001	4.38	0.001		
Parental leave			-0.01	0.000	-0.01	0.000		
Unemployment rate	0.49	-0.001	0.38	0.000	0.20	0.000	0.22	0.000
Employment	0.02	0.000	0.01	0.000	0.01	0.000	0.02	0.000
Employment ²	0.00	0.000	0.00	0.000	0.00	0.000	0.00	0.000
Earnings employment	-3.59	-0.001	-1.33	0.000	0.27	0.000	-4.15	0.000
Earnings employment ²	-0.01	0.000	0.00	0.000	-0.03	0.000	0.06	0.000
Military service	-0.04	0.000						
Vocational training	0.01	0.000	-0.01	0.000	-0.01	0.000	-0.01	0.000
Constant	-255	0.366	-70	0.373	-854	0.373	1730	0.373
R ²	0.06	0.01	0.04	0.01	0.04	0.01	0.01	0.01

Notes: *** p < 0.001, ** p < 0.01, * p < 0.05. Further control variables are time since separation (coefficients are displayed in Figs. 14.1, 14.2 and 14.3)

Table 14.5 Adjusted Wald test for the equality of two coefficients

Year	Men		Women		Women with children	Women without children
	Cumulated	Rate	Cumulated	Rate	Cumulated	Cumulated
-7	0.206	0.009	0.000	0.388	0.000	0.107
-6	0.192	0.050	0.000	0.119	0.000	0.188
-5	0.172	0.061	0.000	0.333	0.000	0.208
-4	0.091	0.001	0.000	0.911	0.000	0.197
-3	0.051	0.005	0.000	0.009	0.000	0.232
-2	0.020	0.001	0.000	0.001	0.000	0.257
-1	0.004	0.000	0.000	0.346	0.000	0.173
0	0.000	0.000	0.000	0.000	0.000	0.095
1	0.000	0.000	0.000	0.000	0.000	0.069
2	0.000	0.000	0.000	0.000	0.000	0.024
3	0.000	0.001	0.000	0.006	0.000	0.021
4	0.000	0.024	0.000	0.014	0.000	0.008

Notes: Displayed are p-values for the H0 hypothesis that two coefficients (control and divorced) are equal

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