Jnl. Soc. Pol. (2021), 50, 3, 552–568 © The Author(s), 2020. Published by Cambridge University Press.
doi:10.1017/S0047279420000264

Balancing work and care: the effect of paid adult medical leave policies on employment in Europe

DEEPA JAHAGIRDAR*, MICHELLE DIMITRIS, ERIN STRUMPF***, JAY S. KAUFMAN****, SAM HARPER*****, JODY HEYMANN******, EFE ATABAY*******, ILONA VINCENT******** AND ARIJIT NANDI*********

*PhD Candidate, Department of Epidemiology, Biostatistics and Occupational Health, McGill University, 1140 Pine Avenue W., Montreal, Quebec, H3A 1A3
email: deepa.jahagirdar@mail.mcgill.ca
**PhD Candidate, Department of Epidemiology, Biostatistics and Occupational Health, McGill University, 1020 Pine Avenue W., Montreal, QC, H3A 1A2
email: michelle.dimitris@mail.mcgill.ca
***Associate Professor, Department of Economics and Department of Epidemiology, Biostatistics and Occupational Health, McGill University, Leacock Building, Room 418, 855 Sherbrooke St. W., Montreal, QC H3A 2T7
email: erin.strumpf@mcgill.ca
****Professor, Department of Epidemiology, Biostatistics and Occupational Health, McGill University, 1020 Pine Avenue W., Montreal, QC, H3A 1A2
email: jay.kaufman@mcgill.ca
*****Associate Professor, Department of Epidemiology, Biostatistics and Occupational Health, McGill University, 1020 Pine Avenue W., Room 36B, Montreal, QC H3A 1A2
email: sam.harper@mcgill.ca
******Distinguished Professor of Health Policy and Management, Distinguished Professor of Public Affairs, and Distinguished Professor of Medicine at UCLA, UCLA Fielding School of Public Health, UCLA, Dean's Office, 650 Charles E. Young Dr. S, 16-035 Center for Health Sciences, Los Angeles, CA 90095-177265
email: jody.heymann@ph.ucla.edu
*******Research assistant, PROSPERED Project, Institute for Health and Social Policy, McGill University, 1130 Pine Avenue W., Montreal, Quebec H3A 1A3
email: Efe.atabay@mcgill.ca
********Academic Associate, PROSPERED Project, Institute for Health and Social Policy, McGill University, 1130 Pine Ave W., Montreal, QC H3A 1A3
email: ilona.vincent@mcgill.ca
*********Associate Professor in the Department of Epidemiology, Biostatistics and Occupational Health, Institute for Health and Social Policy, McGill University, 1130 Pine Avenue W., Montreal, Quebec H3A 1A3
Corresponding author. email: arijit.nandi@mcgill.ca

Background

Increasing caregiving needs for family members has created pressure on prime-age workers. Combined with the ageing population, the demand for care related to illness and disability by relatives mean more of the workforce may have to

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

consider caring needs (Bauer and Sousa-Poza, 2015). 'Informal caregivers' provide care generally without payment (Yoo *et al.*, 2004). In contrast to formal care, informal caregivers usually have a close relationship with the recipient: for example, siblings and adult children. Informal caregiving is considered a desirable option to meet support needs from several perspectives; these caregivers may be preferred by recipients relative to formal arrangements especially during severe acute illnesses. Caregivers may also feel a personal sense of responsibility to look after loved ones rather than defer to strangers (Fine, 2012) though this may depend on the individual's needs and the available alternatives. Although men are starting to play an important role due to shifting social gender roles, the vast majority of informal caregivers are women who increasingly attempt to juggle caring with labour force participation (Carmichael *et al.*, 2008).

Evidence to date has found that caregiving may limit caregivers' ability to remain employed. Dating back to the 1990s, a substantial body of literature has suggested that caring responsibilities negatively impact employment in some way (Gautun and Bratt, 2017; Jacobs *et al.*, 2015; Francesca *et al.*, 2011; Carmichael *et al.*, 2008; Bolin *et al.*, 2008; Berecki-Gisolf *et al.*, 2008). A recent systematic review found that only informal caregivers heavily involved in caregiving are significantly more likely to withdraw from the labour force, (Lilly *et al.*, 2007) while other caregivers had a similar level of employment to non-caregivers. This is potentially due to some degree of self-selection into or out of caregiving roles (Bauer and Sousa-Poza, 2015; Leigh, 2010). However, caring responsibilities are generally found to negatively impact employment, which may be more pronounced among those with less human capital (Crespo and Mira, 2014; Berecki-Gisolf *et al.*, 2008; Henz, 2006). Further, women specifically are more likely to leave the labour force after they start caring for an ill or disabled relative (Pavalko and Henderson, 2006). Beyond the time use, emotional stress and the unpredictability of caring duties can limit productivity in the workplace to the point that people may be forced to reduce or stop employment (Leigh, 2010). In addition to losing current and future financial well-being through various impacts on retirement and pension benefits (McGarry, 2006), a conflict in identity and reduced mental health can result.

Relative to other age groups, older workers face increasing expectations for caring for ageing family members and may be more prone to leave employment. Spousal caregiving is the most frequent type of caregiving among this group (Carmichael *et al.*, 2008), and is associated with higher stress particularly among middle aged and older women (Wu and Penning, 2015). The transition to spousal caregiving tends to entrust older workers with adopting a new caregiving role that can feel foreign. Recently, Cadar (Cadar *et al.*, 2016) demonstrated in a longitudinal study that full-time workers above age 50 were at a higher risk to leave employment than those not providing care, though it may be related to length of the anticipated caregiving need. Further compounding the issue, OECD

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

projections suggest that statutory retirement ages will increase (Finnish Centre for Pensions). For example, Denmark's retirement age is expected to reach aged 72 years by 2050. Going forward, caregiving among older workers would thus hinge on balancing longer work obligations with family roles. Though research on caregiving and employment in the older age group is limited, understanding older workers' employment and the policies that may impact their ability to balance caregiving with paid work is pertinent.

Paid family medical leave policies aim to support a balance between work and caregiving. They are designed to provide income during needed periods of absence. These policies may reduce exit from paid employment and/or the labour force when accompanied by job protections (Berecki-Gisolf *et al.*, 2008; Francesca *et al.*, 2011), particularly where the leave and caregiving intensity is time-limited. Most OECD countries do provide some duration of leave for caregiving, although it is not always paid (Bauer and Sousa-Poza, 2015). By lessening the opportunity cost of caregiving and potentially reducing disruption to labour force participation (Sarasa and Billingsley, 2008), paid family medical leave policies ideally help adults to provide care, minimize income loss and remain in the labor force. The material cost of caregiving is high when it affects employment. In 1997, the economic value of caregiving was estimated at $196 billion in the U.S. alone (Arno *et al.*, 1999). The impact of leaving employment for the individual can be non-recoverable (Pavalko and Artis, 1997).

Although paid family medical leave policies have the potential to increase employment, their effects are underexplored in the literature. The relationship between caregivers and working is as complex as the nature of the job and the person's family and social roles. These roles compete for time, commitment and energy (Marks, 1977), and their totality can become too demanding forcing a change or an undesirable prioritization (Goode, 1960; Marks and MacDermid, 1996). Decisions about commitments to caregiving and work are thus intertwined (Pavalko and Artis, 1997). On the one hand, the intensity and demand of the caregiving role during an acute period of need can impact the ability to remain employed, while, on the other side, the options to transition caregiving to formal services or maintain the caregiving role through flexible work arrangements are also influential in preventing leaving employment entirely. Indeed, workplaces that provide flexible working arrangements are more successful in retaining women in employment after they start caregiving (Pavalko and Henderson, 2006). Caregivers are also repeatedly found to have reduced working hours (Lilly *et al.*, 2007), suggesting this option helps to reconcile the logistical difficulty of competing time use for employment and caring (Leigh, 2010). Paid leave policies may help to buffer against leaving employment where they help individuals during a period of intensity with high caregiving demands, but they may be insufficient where caregiving needs are longer term, flexible working conditions or other transitional services are inaccessible, or if jobs are not adequately protected.

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

Despite potentially variable effects, the impact of paid family medical leave policies on employment is not well understood (Börsch-Supan *et al.*, 2013; Verbakel, 2014; Gautun and Bratt, 2017).

To begin to address this gap, this quasi-experimental study used data from the Survey of Health, Ageing and Retirement in Europe (SHARE) to estimate the impact of introducing paid family medical leave policies on the probability of working among older European men and women.

Methods

Design

To estimate the impact of paid family medical leave policies, we compare the observed probability of working in countries that introduced or extended a paid family medical leave policy to those that did not, using a difference-in-differences design. In this design, respondents in countries that reformed a family medical leave policy ('treated' countries) would have access to different benefits after the policy reform, which might affect their probability of working. The counterfactual is estimated using a set of control countries that did not introduce a paid family medical leave policy during the study period. As in a traditional randomized controlled trial design, the difference-in-differences design does not require that all individuals in the sample are susceptible to, or would be impacted by, the policy. We can determine the overall population-level ('intention-to-treat') impact of the policy without detailed information on those most likely to uptake it.

When the assumptions of the difference-in-differences design are met, it is possible to estimate a causal policy effect. A difference-in-differences design is valid if the control countries experienced a similar trend (but not necessarily level) in the probability of working prior to the treated countries' policy reform and there are no other coincident factors that affect trends in the probability of working over the same time period (Dimick and Ryan, 2014). If these assumptions are met, the controls are assumed to represent the counterfactual for the probability of working in treated countries had they not introduced the policy. The estimated effect consists of the difference of the difference between the probability of working pre and post policy reform in the treated versus control countries. The impact of the policy on the probability of working is therefore estimated as the absolute change in the probability of working in treated countries vis-à-vis the change in control countries.

Sample

We used data from SHARE, a population-based cohort study designed to be representative of the adult population aged 50 years and older in selected European countries (www.share-project.org). At baseline (2004 in most countries), all age-eligible members and spouses in sampled households were selected for in-person

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

interviews, conducted with the assistance of a Computer Assisted Programming Interview application. Survey topics related to health, income, and social networks. The full details on the SHARE survey are available elsewhere (Börsch-Supan *et al.*, 2013). In most countries, SHARE respondents have been followed-up every two years, with refresher samples to maintain initial sample sizes and representativeness. Additional countries joined over time.

Wave 3 of SHARE included a special questionnaire, SHARELIFE, that collected detailed information on the life-course, including childhood, partners, housing, and financial and employment history (Börsch-Supan, 2017; Antonova *et al.*, 2017). All interviews were conducted in 2008-09 except for respondents in Ireland who were interviewed in 2009-11. The employment history began when the respondent left full-time education. Although respondents were interviewed only once, they provided a yearly account of their life histories. To collect life histories, the study used a focused Events History Calendar technique which was developed based on the natural structure of autobiographical memory (Belli, 1998). In the electronic version of this technique, dates for life events such as marriages and jobs are graphically displayed on a life grid that the respondent and interviewer gradually filled in together. Within the application, respondents could look up general country events to provide reference points (Schröder, 2011). A similar method was used for collection in the English Longitudinal Study of Ageing (Scholes *et al.*, 2009), which also served as the basis for other retrospective life history surveys (Kendig *et al.*, 2014).

SHARELIFE included 12,528 men and 15,964 women across 14 countries. We restricted the sample to individuals born in 1958 or earlier, which in practice resulted in excluding spouses of primary survey participants who were born later (n=554). This left 12,482 men and 15,456 women eligible for analyses. We used data starting in 1990 (Figure 1).

Measures

The treatment variable of interest was the introduction of a policy granting paid family medical leave of at least six months. Current data on policies regarding leave for private sector employees to care for sick family members for each sampled country were provided by the University of California Los Angeles World Legal Rights Data Centre, and data on past leave policies starting in 1995 were collected by McGill University's PROSPERED research program (https://www.prosperedproject.com/). We defined paid family medical leave as time-off from work that can be used to care for adult family members with serious or general health problems. While some countries allow this leave to be used for any relative, including children, spouses and parents with any health problem, some limit eligibility based on the severity of illness, degree of relation, adult vs child status, and employee's length of tenure and/or contributions to the social insurance program. We did not include policies that were only available

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

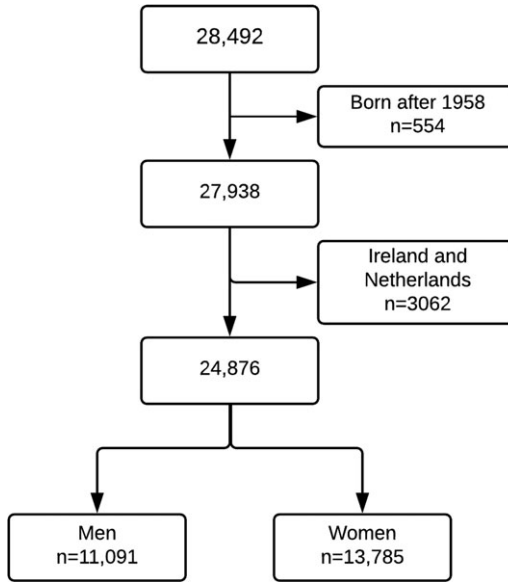

Figure 1. Eligible Sample

for end-of-life care or only for sick children, but did not distinguish policies based on restrictions regarding severity of disease, tenure and/or contributions requirement or degree of relation. Further details on countries' policies are in Supplemental File 1, Table 1 (Supplementary Materials).

Our primary outcome was work status, coded as working or not. Work status was not directly reported, but derived from the self-reported start and end dates of jobs based on the retrospective Job Episodes Panel constructed from the SHARELIFE survey (Antonova *et al.*, 2014; Brugiavini *et al.*, 2013). The start and end dates of jobs were determined based on the life history calendar method described above. For each year within those boundary dates, which were considered 'job spells,' a person was recorded as working part-time or full-time. If there was no reported job, the person was coded as not working. Given the derivation of the working variable and the emphasis on major life events in the data collection methodology, we believe most workers would report job start and end dates that cover a period of leave, such that those on paid leave would be considered as 'working.' (Brugiavini *et al.*, 2013; Antonova *et al.*, 2014; Schröder, 2011) There may be some variability, as highlighted in the Limitations. Employment indicators from SHARELIFE have previously been used: for example, to study labour market outcomes (Wahrendorf, 2015; Antonova *et al.*, 2017) and employment trajectories (Hedel *et al.*, 2016).

Using these variables from SHARELIFE, the data were structured at the individual-level, with a work status indicator for each year starting at 1990 until

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

2008. This in effect created a time series of employment by year for each subject, with respondents nested within country. Subjects in treated countries were given a 1 on a time-dependent policy indicator variable for the post-policy period, while all other time points and subjects were coded as 0.

Treated and Control Countries

Countries eligible to be in the treatment group had to participate in the SHARELIFE Job Episodes Panel, have introduced a paid family medical leave policy of at least six months in duration between 1995 and 2007 and have at least one suitable control country. Countries to be eligible as controls did not introduce a paid leave policy that could affect the probability of working between 1995 and 2007.

Two countries met the criteria to be treated countries: Belgium (1998) and Denmark (2002). With the 2002 adoption of Act No. 359 of 2002 and Act No. 397 of 2002, Denmark gave the right to absence from work for up to 6 months for workers to take care of severely ill or disabled relatives while receiving payments from the municipalities. In 2016, the full-time caregiver allowance was approximately 2900 € (DKK 21,546) per month, not conditional on a certain length of contribution to social insurance schemes. In Belgium, the 1998 policy allowed providing care to seriously ill adult relatives as well as children. This leave could last three months but was expandable up to 12 months and was conditional upon a minimum of 12 months of contributions to the social insurance scheme. The employees on leave were to be compensated with flat rate payments regardless of salary scale; in 2017 this amount was 818 €.

Apart from Ireland and Netherlands, the remaining countries in the survey were eligible as controls. Although Ireland introduced 65 weeks of paid leave to care for seriously ill family members in 2001, we could not find a suitable control group because it simultaneously experienced a period of rapid economic growth associated with a marked reduction in corporate tax rates which could confound results. Netherlands did pass a paid leave policy in the studied time period; however, it provided less than six months of paid leave, meaning the country did not meet our criteria to be a treated or a control country. Notably, France reformed an existing policy in 2001/2 to provide universal assistance to people aged 60 and over who are dependent on others to care for them. While this policy did not meet our criteria to be a treated country, France remained a candidate control country because we did not expect its policy change to substantially influence the average probability of working beyond workers in the personal services sector undertaking formal caregiving. Thus, the existence of the policy change did not result in any violation of the assumptions. We did however conduct a sensitivity analysis to ensure this policy change in France was not driving any observed effect.

After the exclusions, 10 countries included in SHARELIFE were eligible to be controls because they either had consistently the same policy or no adult family medical leave policy over the same time period (France, Sweden, Austria,

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

Czech Republic, Germany, Greece, Italy, Poland, Spain, and Switzerland). We estimated the impact of the reforms occurring in treated countries separately and all analyses were stratified by gender. After eliminating Netherlands and Ireland (n=3062), 11,091 men and 13,785 women who responded to the survey in the remaining countries were eligible across 12 countries (Figure 1).

Control countries were selected for each treated country from the pool of eligible countries based on whether they met the key difference-in-differences design assumption of having a similar pre-policy trend in employment. The selection of control countries was done separately for men and women. In both treated countries and by gender, we identified the functional form of the age-adjusted pre-policy trends in the proportion of respondents working by modeling and comparing trends using: (1) indicator terms for each pre-policy year, (2) a linear term for year, and (3) linear and quadratic terms for year. We determined the appropriate functional form by testing whether parameter(s) for year in each model were significantly different from 0 at the p=0.05 level. After we determined the appropriate functional form, control selection was based on comparing the age-adjusted pre-policy trends in the proportion of respondents working. Specifically, we examined whether the assumption of parallel trends was tenable by testing for differences in pre-policy trends between the treated and candidate control countries using an F-test ('chunk test'). Countries were removed until this F-test suggested that the trends for remaining control countries were not significantly different from the treated country (we relaxed this strict definition in sensitivity analysis, described below). We visually inspected the trends in the remaining countries, and removed those that were not parallel (Supplemental File 2, Supplementary Materials).

Analysis

We estimated the impact of introducing paid adult medical leave on the probability of working using a linear probability model with cluster-robust standard errors. As our sample consisted of older adults, we expected to see secular trends in our outcome, i.e. the average probability of working would diminish over time naturally. To adjust for this, we included linear and quadratic terms for calendar year that would allow the relationship between the probability of working and time to vary. Further, we adjust for age using a categorical variable that would allow the probability of working to vary flexibly within each category only.

The model for individual i in country c at time t took the general form in (1).

$$Y_{ict} = \alpha + \beta x_{ct} + \gamma_c + \delta year_t + \tau year_t^2 + \sum_{a=1}^{4} \theta_a age_i + \varepsilon_{ict} \qquad (1)$$

where β is the parameter of interest, i.e. the effect of the policy reform on the probability of working, Y_{ict}. We included fixed effects for country γ_c and linear and quadratic terms for calendar year, δ and τ. The age categories (30-39, 40-49,

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

50-59, 60-69, 70+) were included in the fully adjusted model and standard errors were clustered at the individual level (Esarey and Menger, 2018). The estimated coefficient β measures whether there is any change, on average, in the probability of working in the treated country before vs. after its reform relative to corresponding changes in control countries.

Sensitivity Analysis

We assessed the robustness of our main findings using several approaches. First, we estimated 'lead' and 'lag' effects. This involved re-assigning the year of the policy change as two years prior and two years after the year the change actually occurred, respectively. The primary analysis was then re-run with the artificial policy year to detect if there was i) evidence of a policy effect before the policy was actually passed, which would represent evidence against a causal policy effect, or ii) whether any policy effect appeared and/or persisted into the post-policy period. Second, we examined the sensitivity of our main findings to the composition of the control group. Alternate control groups were created by relaxing and tightening the p-value criterion of 0.05 used to select controls, and by using quadratic parallel trends rather than linear where it was deemed appropriate. Third, we included additional variables that could predict work status, and explored the impact of retirement by i) including individuals' eligibility for 'normal' retirement in a given country-year; ii) restricting to only non-retired people; and iii) excluding those who retired before policies changed. Though our design is not invalidated by the inclusion of people who are retired, this sensitivity analysis sought to determine whether the effect estimates changed when restricting the sample to those most likely to be affected by the policy. Fourth, we conducted a post-hoc sensitivity analysis excluding France as a control as it was ultimately selected as an appropriate control country for Belgium. Finally, we included the sampling weights provided by SHARE. Further details regarding the sensitivity analyses are provided in Supplemental File 3 (Supplementary Materials).

All analyses were done in RStudio and Stata 14 (StataCorp, 2015). The full code for the primary and sensitivity analyses and instructions on replicating our results are available at www.github.com/deepajag/paid-leave, and on https://dataverse.harvard.edu/dataverse/3po.

Results

Sample Description

To estimate the effect of introducing paid family leave in Belgium, three control countries were selected based on linear pre-policy trends for analyses of women (Greece, France and Italy) and men (France, Spain and Switzerland) (Figure 2). For Denmark, we identified two countries with parallel pre-policy trends for each gender, i.e. Greece and Sweden for men and Austria

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

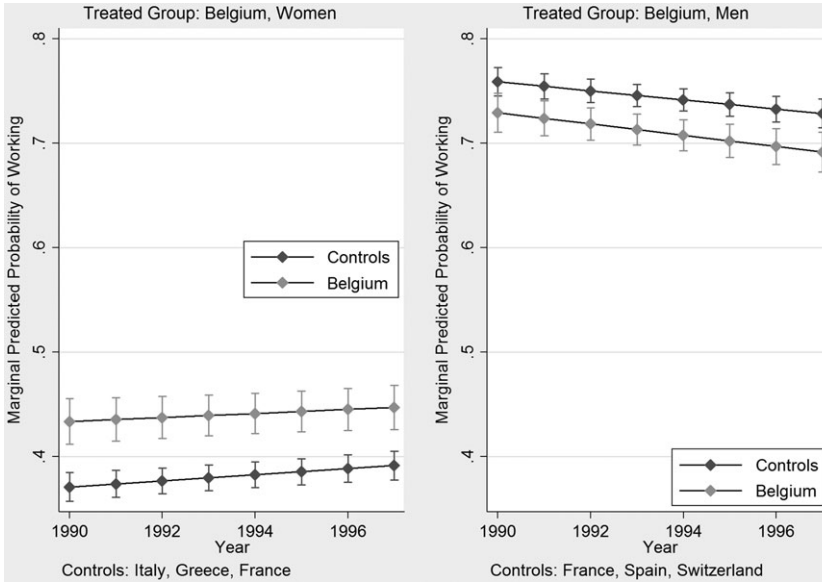

Figure 2. Pre-policy employment trend in Belgium vs Controls

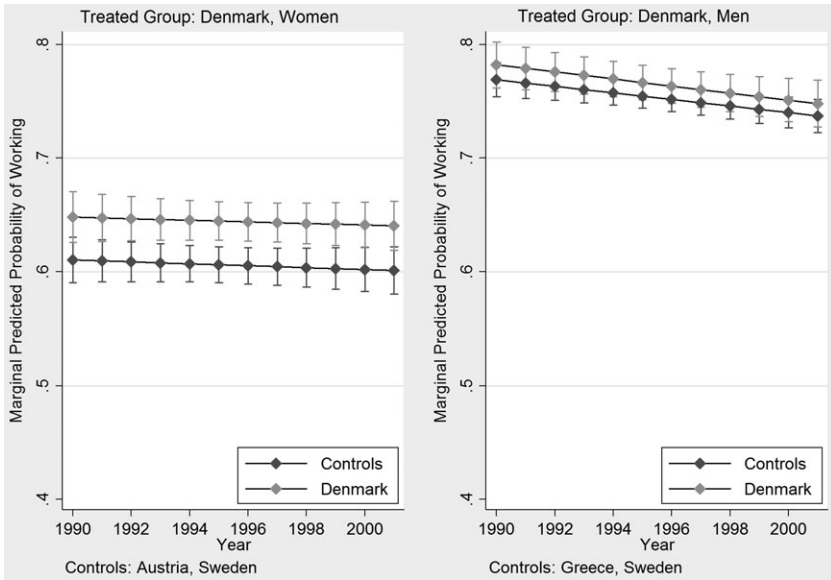

Figure 3. Pre-policy employment trend in Denmark vs Controls

and Sweden for women (Figure 3). We found little evidence for differences in age-adjusted pre-policy trends in each treated country and its selected control group based on both visual examination of parallel trends and the F-test for joint significance of the effect of treatment status and year on the proportion working

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

TABLE 1. Sample Description

Country	Sample size	Mean age in 1990 (SD)	Mean proportion working pre-policy (SD)	Mean proportion working post-policy (SD)	Mean difference in proportion working pre/post policy
Belgium, Women	1544	48.88 (10.42)	0.41 (0.03)	0.28 (0.05)	−0.14
Controls[i]	4382	47.87 (10.05)	0.38 (0.03)	0.26 (0.04)	−0.13
Belgium, Men	1270	48.43 (9.78)	0.72 (0.06)	0.43 (0.1)	−0.29
Controls[ii]	2621	48.82 (9.78)	0.74 (0.06)	0.46 (0.09)	−0.27
Denmark, Women	1139	47.41 (10.64)	0.66 (0.06)	0.47 (0.05)	−0.19
Controls[iii]	1657	49.71 (9.60)	0.59 (0.08)	0.35 (0.04)	−0.24
Denmark, Men	952	46.84 (9.44)	0.79 (0.07)	0.54 (0.06)	−0.25
Controls[iv]	2193	48.75 (9.18)	0.74 (0.09)	0.46 (0.05)	−0.28

i) France, Greece, Italy; ii) France, Spain, Switzerland; iii) Austria, Sweden; iv) Greece, Sweden

(Supplemental File 2, Supplementary Materials). Thus, we ensured that our study met one of the key assumptions of the difference-in-differences approach both visually and statistically.

The proportion working across all countries declined between the pre- and post-policy periods. Absolute declines in the proportion working were larger in magnitude for men than women. The mean age across all included countries in 1990, the first year of our study, was 48 years and was relatively consistent across countries (Table 1). The breakdown by country is available in Supplemental File 1, Table 2 (Supplementary Materials).

Main Results

There was limited evidence that the introduction of paid family medical leave had an impact on the proportion of the population working (Table 2). In Belgium, the policy introduction was associated with 1.2 (95% CI -0.4 to 2.8) and 1.9 (95% CI 0.1 to 3.7) percentage point reductions in the proportions of women and men working, relative to control countries, respectively. In Denmark we found little evidence of a policy effect (percentage point difference = 0.8 [95% CI -1.4 to 3.0] for women and percentage point difference = 1.0 [95% CI −1.1 to 3.1] for men relative to control countries). The full regression results are available in Supplemental File 1, Table 3 (Supplementary Materials).

Sensitivity Analyses

The effect estimates were similar when the policy year was shifted to two years before and two years after the true policy year, suggesting that any changes

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

TABLE 2. Main results: Effect of policy introduction on proportion working

	Coefficient[i] [95% Confidence Interval]
Belgium, women (controls: Greece, France, Italy)	−1.2 [-2.8;0.4]
Belgium, men (controls: France, Spain, Switzerland)	−1.9 [-3.7;-0.1]
Denmark, women (controls: Austria, Sweden)	0.8 [-1.4;3]
Denmark, men (controls: Greece, Sweden)	1.0 [-1.1;3.1]

[i]Fixed effects for country and square terms for year and age category. The effect estimates represent the mean percentage point difference in proportion working in treatment vs control countries (before vs. after the policy change)

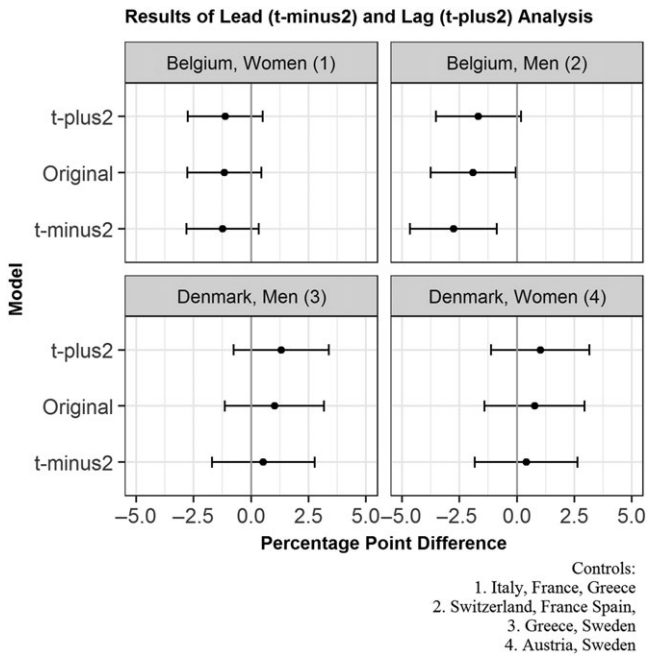

Figure 4. Lead and lag effects

in the proportion working were not likely attributable to the introduction of paid family medical leave (Figure 4). Additional sensitivity analyses, including the examination of different control countries, selecting controls based on non-linear time trends for the outcome, and including sampling weights, were consistent with our main findings. The estimates were also consistent when the primary model was adjusted for the age of retirement eligibility, restricted only to the non-retired population, eliminating France as a control, and when including

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

other country-level characteristics. Excluding those who had retired before policy changes resulted in the stronger magnitudes for the estimated effects, but did not alter conclusions (Supplemental file 3, Supplementary Materials).

Discussion

Overall, we did not find consistent evidence that the introduction of paid family medical leave policies in Belgium and Denmark affected the proportion of older adults working. Our sensitivity analyses were consistent with the main estimates.

The broader context of the policies and workplaces may have limited the policies' impact. The availability and affordability of other services could support these policies to improve employment if they are sufficient to allow a transition back to employment. The strength of formal arrangements in Denmark, for example, has allowed elderly people to utilize these services instead of relying on family (Rostgaard and Szebehely, 2012). However these arrangements in addition to flexible working arrangements may not be enough for caregivers. Second, caregivers may stay in employment by compromising elsewhere or because the financial tradeoff is imbalanced. Caregivers have been previously hypothesized to reduce leisure time instead of employment, or to maintain employment to afford care, keep insurance, and/or provide a distraction (Jacobs *et al.*, 2015; Agree and Glaser, 2009). Third, there is also the possibility that some caregivers were more likely to cease working after taking up the leave. In sensitivity analyses that explored our findings in relation to retirement indicators we did find that the estimated effect was stronger (though less precise), which could support such a theory.

There are also alternate outcomes that the policies could affect rather than employment, which could provide avenues for future research. Paid family medical leave policies may have a primary impact on income rather than employment (Berecki-Gisolf *et al.*, 2008). Workers may substitute a choice of unpaid leave with paid leave, rather than choose to leave employment altogether pre-policy. The financial strain associated with unpaid leave (Lester, 2005) means that paid leave policies may still have positive effects related to income, but we were unable to study the extent to which such substitution may occur. Firms may have also changed their practices in response to the policy change. By creating fewer jobs that may otherwise have been available to this older group of people who would be more likely to make use of the policy, the average employment probability may decline (Ahn and Yelowitz, 2015). This phenomenon could potentially offset any gains or explain some of our effects that were in a negative direction in Belgium. Finally, the policies may have only affected certain subgroups for which we would not be able to detect an impact. Previously, only those providing the most intense levels of care have been found to leave employment (Lilly *et al.*, 2007), and thus the probability

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

of leaving may only be improved among them. Studying these subgroups could shed light on this question.

This study has limitations associated with the data and study design. Data on work histories were collected retrospectively based on self-report, raising concerns that information could be remembered incorrectly. This is likely not different across countries and previous work has found recall bias in this survey was minimal (Mazzonna and Havari, 2011). Our estimate may be biased towards the null due to variability in the way respondents reported their job status when respondents were on leave, though we expect this to be minimal as the working variable was constructed based on the starts and end dates of jobs. It is also possible that we may not have captured time-varying factors within treated countries that could affect the probability of working, a key assumption on our study design. An independent policy was introduced in the Flanders region of Belgium in 2001 with a cash benefit of 130 Euros/month; though, given that it is not enough to cover formal care options, it would likely have minimal influence on the general probability of staying employed. We could not find other major initiatives over our study's time frame that could explain our findings. To mitigate the potential for residual confounding, we also selected controls based on parallel trends, and conducted several sensitivity analyses with country-level economic factors to test the robustness of our preferred specifications. Inherently, the difference-in-differences method is biased towards the null like the analogous randomized controlled trial design. However, this does not explain our findings because we were still unable to see a pattern in lead/lags that was consistent with a policy effect. Finally, the size of the working population within the study samples may also have reduced our ability to detect small policy effects precisely and forced us to treat part- and full-time status together, despite the potential for switching between the two.

Conclusion

We found little evidence that paid family medical leave policies had an important impact on the proportion of older adults working in Denmark or Belgium. In estimating the impacts of these policies on employment, we addressed an important gap in the literature: namely, whether these policies which provide income during leave also impact employment. In the absence of other changes regarding the availability and affordability of long term care services, paid family leave was not sufficient to increase average employment. Further research should examine the impact of paid family leave when combined with the availability of affordable long term care. This evidence base will ultimately help to inform policy objectives to support those caring for elderly parents, spouses, other kin and partners in the context of a rapidly ageing population.

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

Acknowledgements

This study was supported by the Foundation Grant "Development epidemiology: identifying evidence-based interventions for improving population health and promoting health equity (FRN 148467) and the Canada Research Chairs program (AN). Support was also provided by UCLA Public Health under Service Agreement Number 1915 UA132. All opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the view of the Sponsors. Strumpf and Harper were supported by Chercheur-boursier Junior 2 awards from the Fonds de recherche du Québec – Santé.

This paper uses data from SHARE Waves 1, 2, 3 (SHARELIFE), 4, 5 and 6 (DOIs: 10.6103/SHARE.w1.610, 10.6103/SHARE.w2.610, 10.6103/SHARE.w3.610, 10.6103/SHARE.w4.610, 10.6103/SHARE.w5.610, 10.6103/SHARE.w6.610) see Börsch-Supan *et al.* (2013) for methodological details.

The SHARE data collection has been primarily funded by the European Commission through FP5 (QLK6-CT-2001-00360) FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARELIFE: CIT4-CT-2006-028812) and FP7 (SHARE-PREP: N°211909, SHARE-LEAP: N°227822, SHARE M4: N°261982). Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

This paper uses data from the generated Job Episodes Panel (DOI: 10.6103/SHARE.jep.600) see Brugiavini *et al.* (2013) and Antonova *et al.* (2014) for methodological details. The Job Episodes Panel release 6.0.0 is based on SHARE Waves 1, 2 and 3 (SHARELIFE) (DOIs: 10.6103/SHARE.w1.600, 10.6103/SHARE.w2.600, 10.6103/SHARE.w3.600).

Declaration of interest

We have no conflicts of interest to declare.

Supplementary material

To view supplementary material for this article, please visit https://doi.org/10.1017/S0047279420000264

References

Agree, E.M. and Glaser, K. (2009), Demography of informal caregiving. *International handbook of population aging*. Springer, 647–668.

Ahn, T. and Yelowitz, A. (2015), The short-run impacts of Connecticut's paid sick leave legislation. *Applied Economics Letters* 22: 1267–1272.

Antonova, L., Aranda, L., Pasini, G., et al. (2014), Migration, family history and pension: the second release of the SHARE Job Episodes Panel. *Working Paper Series* 18.

Antonova, L., Aranda, L, Brugiavini, A., Cavapozzi, D., Pasini, G. and Trevisan, E. (2017), SHARE Job Episodes Panel. Releaseversion: 6.0.0 SHARE-ERIC. *Dataset*. *DOI:* 10.6103/SHARE.jep.600.

Arno, P.S., Levine, C. and Memmott, M.M. (1999), The Economic Value Of Informal Caregiving: President Clinton's proposal to provide relief to family caregivers opens a long-overdue discussion of this "invisible" health care sector. *Health Affairs* 18: 182–188.

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

Bauer, J.M. and Sousa-Poza, A. (2015), Impacts of Informal Caregiving on Caregiver Employment, Health, and Family. *Journal of Population Ageing* 8: 113–145.
Belli, R.F. (1998), The structure of autobiographical memory and the event history calendar: potential improvements in the quality of retrospective reports in surveys. *Memory* 6: 383–406.
Berecki-Gisolf, J., Lucke, J., Hockey, R., et al. (2008), Transitions into informal caregiving and out of paid employment of women in their 50s. *Social Science & Medicine* 67: 122–127.
Bolin, K., Lindgren, B. and Lundborg, P. (2008), Your next of kin or your own career?: Caring and working among the 50+ of Europe. *Journal of Health Economics* 27: 718–738.
Börsch-Supan, A. (2017), Survey of Health, Ageing and Retirement in Europe (SHARE), Wave 3 – SHARELIFE. In: 10.6103/SHARE.w3.600 S-EDsD (ed) Release version: 6.0.0. ed.
Börsch-Supan, A., Brandt, M., Hunkler, C., et al. (2013), Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology* 42: 992–1001.
Brugiavini, A.C., Cavapozzi, D., Pasini, G. and Trevisan, E. (2013), Working life histories from SHARELIFE: a retrospective panel. *SHARE Working Paper Series 11-2013*. Munich, Germany.
Cadar, D., Murray, E.T., Head, J., et al. (2016), The Association Between Informal Caregiving and Exit From Employment Among Older Workers: Prospective Findings From the UK Household Longitudinal Study. *The Journals of Gerontology: Series B* 73: 1253–1262.
Carmichael, F., Hulme, C., Sheppard, S., et al. (2008), Work – life imbalance: Informal care and paid employment in the UK. *Feminist Economics* 14: 3–35.
Crespo, L. and Mira, P. (2014), Caregiving to elderly parents and employment status of European mature women. *Review of Economics and Statistics* 96: 693–709.
Dimick, J.B. and Ryan, A.M. (2014), Methods for Evaluating Changes in Health Care Policy: The Difference-in-Differences ApproachDifference-in-Differences ApproachJAMA Guide to Statistics and Methods. *JAMA* 312: 2401–2402.
Esarey, J. and Menger, A. (2018), Practical and effective approaches to dealing with clustered data. *Political Science Research and Methods*: 1–19.
Fine, M.D. (2012), Employment and Informal Care: Sustaining Paid Work and Caregiving in Community and Home-based Care. *Ageing International* 37: 57–68.
Finnish Centre for Pensions. *Retirement ages in Member States*. Available at: https://www.etk.fi/en/the-pension-system/international-comparison/retirement-ages/
Francesca, C., Ana, L-N., Jérôme, M., et al. (2011), *OECD health policy studies help wanted? Providing and paying for long-term care: providing and paying for long-term care*: OECD Publishing.
Gautun, H. and Bratt, C. (2017), Caring too much? Lack of public services to older people reduces attendance at work among their children. *European Journal of Ageing* 14: 155–166.
Goode, W.J. (1960), A theory of role strain. *American sociological review*: 483–496.
Hedel, K.v., Mejía-Guevara, I., Avendaño, M., et al. (2016), Work–Family Trajectories and the Higher Cardiovascular Risk of American Women Relative to Women in 13 European Countries. *American Journal of Public Health* 106: 1449–1456.
Henz, U. (2006), Informal Caregiving at Working Age: Effects of Job Characteristics and Family Configuration. *Journal of Marriage and Family* 68: 411–429.
Jacobs, J.C., Van Houtven, C.H., Laporte, A., et al. (2015), Baby Boomer caregivers in the workforce: Do they fare better or worse than their predecessors? *The Journal of the Economics of Ageing* 6: 89–101.
Kendig, H., Byles, J.E., O'Loughlin, K., et al. (2014), Adapting data collection methods in the Australian Life Histories and Health Survey: a retrospective life course study. *BMJ open* 4: e004476.
Leigh, A. (2010), Informal care and labor market participation. *Labour Economics* 17: 140–149.
Lester, G. (2005), A defense of paid family leave. *Harvard Journal of Law & Gender*, 28: 1.

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press

Lilly, M.B., Laporte, A. and Coyte, P.C. (2007), Labor market work and home care's unpaid caregivers: a systematic review of labor force participation rates, predictors of labor market withdrawal, and hours of work. *The Milbank Quarterly* 85: 641–690.

Marks, S.R. (1977), Multiple roles and role strain: Some notes on human energy, time and commitment. *American sociological review*: 921–936.

Marks, S.R. and MacDermid, S.M. (1996), Multiple roles and the self: A theory of role balance. *Journal of Marriage and the Family*: 417–432.

Mazzonna, F. and Havari, E. (2011), Can we trust older people's statements on their childhood circumstances? Evidence from SHARELIFE. *SHARE Working Paper Series* 05-2011.

McGarry, K.M. (2006), Does caregiving affect work? Evidence based on prior labor force experience. *Health care issues in the United States and Japan*. University of Chicago Press, 209–228.

Pavalko, E.K. and Artis, J.E. (1997), Women's caregiving and paid work: Causal relationships in late midlife. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 52: S170–S179.

Pavalko, E.K. and Henderson, K.A. (2006), Combining Care Work and Paid Work:Do Workplace Policies Make a Difference? *Research on Aging* 28: 359–374.

Rostgaard, T. and Szebehely, M. (2012), Changing policies, changing patterns of care: Danish and Swedish home care at the crossroads. *European Journal of Ageing* 9: 101–109.

Sarasa, S. and Billingsley, S. (2008), Personal and household caregiving from adult children to parents and social stratification. *Families, Ageing and Social Policy: Intergenerational Solidarity in European Welfare States*: 123.

Scholes, S., Medina, J., Cheshire, H., et al. (2009), Living in the 21st century: Older people in England. The 2006 English longitudinal study of ageing. Technical report.

Schröder, M. (2011), Retrospective data collection in the Survey of Health, Ageing and Retirement in Europe. SHARELIFE methodology. *Mannheim: MEA*.

Verbakel, E. (2014), Informal caregiving and well-being in Europe: What can ease the negative consequences for caregivers? *Journal of European Social Policy* 24: 424–441.

StataCorp. (2015), Stata Statistical Software: Release 14. College Station, TX: StataCorp LP.

Wahrendorf, M. (2015), Previous employment histories and quality of life in older ages: sequence analyses using SHARELIFE. *Ageing & Society* 35: 1928–1959.

Wu, Z. and Penning, M.J. (2015), Caregiver Stress and Mental Health: Impact of Caregiving Relationship and Gender. *The Gerontologist* 56: 1102–1113.

Yoo, B-K., Bhattacharya, J., McDonald, K.M., et al. (2004), Impacts of informal caregiver availability on long-term care expenditures in OECD countries. *Health services research* 39: 1971–1992.

https://doi.org/10.1017/S0047279420000264 Published online by Cambridge University Press