



Who cares when care closes? Care-arrangements and parental working conditions during the COVID-19 pandemic in Germany

Gundula Zoch ^a, Ann-Christin Bächmann^{a,b} and Basha Vicari^b

^aLeibniz Institute for Educational Trajectories, Bamberg Germany; ^bInstitute for Employment Research, Nuremberg, Germany

ABSTRACT

This study examines the short-term consequences for care-arrangements among working parents, who were affected by the closure of schools and institutional childcare as a result of the COVID-19 pandemic in Germany. By applying multinomial logistic regression models to novel data from two panel surveys of the National Educational Panel Study and its supplementary COVID-19 web survey, the study finds that mothers continue to play a key role in the care-arrangements during the first months of the pandemic. Moreover, the results illustrate the importance of working conditions, especially the possibility of remote work for the altered care-arrangements. Overall, the findings point towards systematic gender differences in the relationship between parental working conditions and the care-arrangements.


KEYWORDS Childcare; gender division of family work; school closure; corona lockdown; NEPS-C

Introduction

To contain the COVID-19 pandemic, childcare facilities and schools around the world were closed in spring 2020. For several months, parents had to reorganise the care of their children (Alon *et al.* 2020), which has posed new challenges for reconciling work and family.

Although fathers have become more involved, mothers seem to have taken over most of the care work (Hank and Steinbach 2020; Kreyenfeld *et al.* 2020; Möhring *et al.* 2020; Zinn *et al.* 2020). However, first studies also suggest that women in particular work in so-called ‘system-relevant occupations’ of public interest (e.g. Kleinert *et al.* 2020) and thus often continued working onsite. Against this background, not all parents and

CONTACT Gundula Zoch  gundula.zoch@lifbi.de  Leibniz Institute for Educational Trajectories, Wilhelmsplatz 3, Bamberg, 96047 Germany

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especially mothers could easily combine work and childcare (e.g. Bünning *et al.* 2020; Möhring *et al.* 2020; Schröder *et al.* 2020).¹

Whereas most cross-sectional studies on Germany are based on non-random ad-hoc web surveys, there are only a few panel studies to date that provide evidence on altered care-arrangements within couples. Kreyenfeld *et al.* (2020) show that parents significantly extended their childcare time, with higher relative contributions of mothers. Hank and Steinbach (2020), however, report both increases and decreases in female's share to childcare. The authors find that remote work of male partners is particularly linked to female's relative contributions, whereas female's altered working hours were not associated with changes in childcare.

Our study adds to the existing literature, by investigating which individual or job-related characteristics (system-relevant occupation, altered working hours, and remote work) are related to different care-arrangements. We focus on parents who were all employed before the COVID-19 pandemic and were thus particularly affected by the closure of schools and childcare facilities. To obtain a comprehensive picture, we examine the determinants of care-arrangements separately for (1) mothers and fathers and contrast (2) families with 14–15 year old schoolchildren with parents of school- and pre-school children under 14 years of age. We use a novel data combination from two independent panel surveys of the National Educational Panel Study (NEPS) and a supplementary COVID-19 web survey for each of these two panel surveys.

Theoretical Framework

The continuing gendered division of family work (Davis and Greenstein 2009) has so far been explained mainly by three approaches (e.g. Schober and Zoch 2019): the neo-classical economic theory (Becker 1981), resource-bargaining perspectives (e.g. Lundberg and Pollak 1996), and constructivist approaches of gender role identities (e.g. West and Zimmerman 1987). If working conditions had not changed significantly due to COVID-19, the two resource-based approaches would suggest that mothers are likely to continue to provide most of the care during the pandemic closure of schools and childcare facilities. As women work in lower-paid occupations, sectors, and positions (Boll and Lagemann

¹See Zoch *et al.* 2020 for a more detailed overview of international studies on pandemic-related altered care-arrangements.

2018), and therefore have less bargaining power to negotiate lower contributions to family work, women were presumed to act as main caregivers once formal childcare is no longer available. Moreover, identity theories and role occupancy perspective suggest that, in addition to economic resources, traditional gender roles could also be responsible for a traditional care-arrangements during the pandemic. Accordingly, mothers with traditional attitudes may wish to temporarily increase their involvement in childcare in view of closed childcare facilities. Conversely, parents with less traditional attitudes are presumed to divide the care work more equally.

However, with the COVID-19 pandemic, long-term negotiation processes based on previously stable opportunity structures, economic resources, and individual work-care norms might have lost importance. Instead, we expect parental working conditions to play a particularly important role for care-arrangements in families during the pandemic. In particular, parents working in 'system-relevant occupations' faced a particular challenge. Many of them were unable to work remotely, and often even had to extend their working hours, especially in the health or food sector (e.g. Kleinert *et al.* 2020). Conversely, pandemic-related reductions in working hours or extended remote work for parents in office jobs most likely provided better opportunities for parents to look after their children themselves. Hence, we expect that parents will be less involved in childcare if they work in a system-relevant occupation (*hypothesis 1*), have to work more hours (*hypothesis 2*), and are unable to work remotely (*hypothesis 3*).

Data and Estimation Strategy

Data and Samples

We use novel data on parents with children that are based on two independent panel surveys of the National Education Panel Study (NEPS) (Blossfeld *et al.* 2011)²: Starting Cohort 2 (NEPS-SC2 'Kindergarten') and 6 (NEPS-SC6 'Adults'). We combine the (1) publicly available scientific use files of the two NEPS starting cohorts with (2) the recently

²From 2008 to 2013, NEPS data was collected as part of the Framework Program for the Promotion of Empirical Educational Research, funded by the German Federal Ministry of Education and Research (BMBF). As of 2014, NEPS is carried out by the Leibniz Institute for Educational Trajectories (LIfBi) at the University of Bamberg, Germany, in cooperation with a nationwide network. Among others, the data set contains detailed longitudinal information on individuals' educational careers and other individual and household characteristics.

collected and therefore unpublished respective waves (consortium data B130_C1 and B145_C1), and with (3) a supplementary COVID-19 web survey of both starting cohorts (Corona_CAWI_C2).³ In the latter, participants were asked about the direct consequences of the COVID-19 pandemic, focusing particularly on the respondent's working conditions as well as chosen care-arrangements of parents during the closure of schools and childcare facilities.

These novel longitudinal data enable us to examine how pandemic-related changes in working conditions influence the care-arrangements in two types of families that are based on the two NEPS starting cohorts:

The study NEPS-SC2 (2010–2019) consists of mothers with at least one child aged 14–15 years.⁴ It contains detailed information on the child, the parents, and the household context (Berendes *et al.* 2019). The supplementary COVID-19 survey interviewed the parent who was also the respondent in previous waves, in most cases the mother. We reduced our analytic sample to mothers that were employed before the COVID-19 pandemic and affected by the pandemic-related closure of schools. Due to low case numbers, fathers were excluded from the analyses. Based on observations with complete information on the care-arrangement and relevant controls, our first analytic sample consists of 785 mothers in couples with at least one schoolchild aged 14–15 years.

The study NEPS-SC6 (2009–2020) consists of more than 17,000 individuals born between 1944 and 1986. The supplementary COVID-19 survey addressed all respondents. We reduced our analytic sample to mothers and fathers in couples with a pre-school or schoolchild under 14 years of age. Again, all parents were employed before the pandemic and affected by the closure of the school or childcare facility. Based on observations with complete information, the second and third analytic subsamples consists of 139 mothers and 156 fathers.

Measures and Estimation Strategy

In the supplementary COVID-19 web survey, respondents were asked to indicate which care options the family had used when schools and childcare facilities were closed (for further details see Table A1 and Figure A1 in the Online Appendix and the online questionnaire in Zoch *et al.* 2020). Based on these multiple care indicators we created a variable,

³The Corona-CAWI was conducted from 15 May to 22 June 2020. Consortium data from the National Educational Panel Study and Corona-CAWI data are not yet available as scientific use files.

⁴The initial sample was drawn from pupils attending the first grade of primary school in 2012.

distinguishing whether care was provided (1) exclusively by mothers; (2) exclusively by fathers; (3) by both parents, (4) by a mixed arrangement, consisting of parental care, family members, relatives, or formal emergency care; or whether (5) the child was predominantly unsupervised (only NEPS-SC2).⁵ Table 1 presents the weighted summary statistics of the dependent and independent variables for the three subsamples.⁶

We examined the relevance of different care-arrangements by estimating multiple multinomial logistic regression models. First, we analysed the care-arrangements of families with older schoolchildren (NEPS-SC2) by using the larger sample of previously employed mothers. To compare and examine whether the previously observed patterns apply to families with greater care demands and to both mothers and fathers, we secondly extended our analyses to the two smaller subsamples of working mothers and fathers with younger children under age 14 (NEPS-SC6).

We estimated stepwise multinomial regression models and included the following control variables in the baseline models: respondent's age, migration background, household size, number of under-6-years-olds (only NEPS-SC6) and under-14-years-olds in the household, and place of residence (East or West Germany). To ensure that individual work-care norms did not drive the observed care-arrangements, we included respondent's education (no college degree, college degree, university degree) and the agreement with the traditionally slanted pre-crisis attitudinal measure '*it's the man's job to earn money and the woman's job to take care of the household and family*'.

In the following steps, we examined the role of working conditions and included a dummy variable indicating whether the parent identifies with working in a job classified as a system-relevant occupation (e.g. health care, power supply, food supply, public transport, for an overview see Zoch *et al.* 2020). In addition, we analysed the relevance of increased or decreased individual working hours and the possibility to work remotely during the first months of the pandemic.

⁵Due to a very small number of fathers with exclusive paternal care, categories 2 and 3 were combined for the multivariate analyses.

⁶All three subsamples result from long-running panel surveys that are subject to different selection processes. All descriptive findings are therefore presented by using weights. These weights adjust both for the sampling design of the two starting cohorts as well as non-response failure processes between the initial samples of the first wave and the realised participation in the supplementary waves. In addition, the used weights are post-stratified, i.e. the observed distributions are adjusted to the distributions observed in official statistics. This calibration was implemented separately for both starting cohorts based on different characteristics such as year of birth, gender, country of origin (Germany vs other), and federal state (for more details see Würbach *et al.* 2020). The unweighted distribution of all variables and original care indicators are included in Table A7 in the Online Appendix.

Table 1. Weighted descriptive statistics.

	Mothers with schoolchild (NEPS-SC2)			Mothers with pre-school/ schoolchild (NEPS-SC6)			Fathers with pre-school/ schoolchild (NEPS-SC6)		
	Mean/ Prop.	SD	n	Mean/ Prop.	SD	N	Mean/ Prop.	SD	n
Dependent variable									
<i>care-arrangement</i>									
1. mother only	0.30	0.46	785	0.30	0.46	139	0.29	0.46	156
2. father only	0.04	0.20	785	0.03	0.18	139	0.08	0.27	156
3. both parents	0.11	0.31	785	0.21	0.41	139	0.42	0.49	156
4. mix	0.22	0.42	785	0.46	0.50	139	0.21	0.41	156
5. child unsupervised	0.33	0.47	785						
Further variables									
age in years	42.12	5.23	785	42.06	5.00	139	42.00	6.13	156
<i>cohort</i>									
1. < 1970	0.10	0.29	785	0.06	0.23	139	0.11	0.31	156
2. 1970–1975	0.27	0.44	785	0.28	0.45	139	0.22	0.42	156
3. 1976–1979	0.36	0.48	785	0.28	0.45	139	0.28	0.45	156
4. 1980 +	0.28	0.45	785	0.39	0.49	139	0.40	0.49	156
migration background (ref. none)	0.12	0.33	785	0.43	0.50	139	0.22	0.42	156
<i>education</i>									
1. no college degree (ref.)	0.47	0.50	785	0.58	0.50	139	0.56	0.50	156
2. college degree	0.30	0.46	785	0.33	0.47	139	0.19	0.39	156
3. university degree	0.23	0.42	785	0.10	0.30	139	0.25	0.43	156
gender role attitude (1 less traditional – 4 more traditional)	1.77	0.75	785	1.57	0.83	139	1.63	0.66	156
number of children under age 6 in household	0.00	0.00	785	0.40	0.65	139	1.01	1.03	156
number of children under age 14 in household	1.42	1.07	785	1.51	0.55	139	1.99	0.82	156
household size	4.43	0.95	785	3.88	0.68	139	4.33	0.93	156
East Germany (ref.: West Germany)	0.24	0.43	785	0.13	0.34	139	0.15	0.36	156
employed before Covid-19 lockdown (ref.: no)	1.00	0.00	785	1.00	0.00	139	1.00	0.00	156
system-relevant occupation (ref.: no)	0.53	0.50	785	0.59	0.49	139	0.42	0.50	156
<i>change in working hours</i>									
same (ref.)	0.43	0.49	785	0.31	0.47	139	0.44	0.50	156
less	0.35	0.48	785	0.53	0.50	139	0.46	0.50	156
more	0.23	0.42	785	0.16	0.36	139	0.10	0.30	156
remote work (ref.: no)	0.52	0.50	733	0.24	0.43	122	0.51	0.50	150

Note: Reference category indicated with (ref.).

Source: NEPS-SC2, B130_C1; NEPS-SC6, B145_C1; NEPS-Corona_CAWI_C2. Weighted results, own calculations.

Results

The descriptive results, shown in Figure 1, illustrate that about one-third of families relied on exclusive maternal care, whereas exclusive paternal care was rare (4–6%). While about a third of the 14-years old schoolchildren were not looked after, 31% of the parents with a younger child opted for shared care or used a mixed care-arrangement (33%). Overall, the descriptive results suggest that during the first months of the COVID-

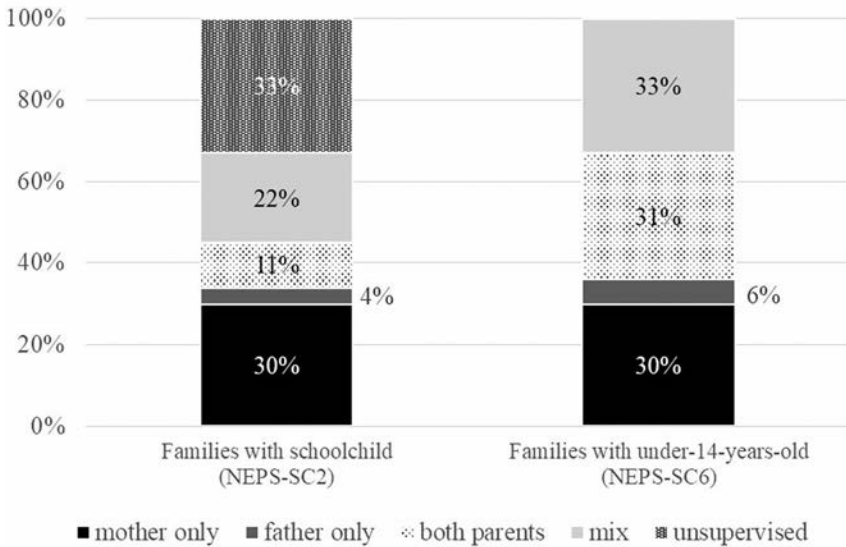


Figure 1. Care-arrangements in families with schoolchild (NEPS-SC2, mothers) and pre-/schoolchild (NEPS-SC6, B145_C1 mothers + fathers).

Source: NEPS-SC2, B130_C1 & NEPS-Corona_CAWI_C2. Weighted results, own calculations.

19 pandemic, mothers continued to serve as main caregivers, whereas fathers and relatives remained in a supporting role.

However, during the first months of the pandemic, mothers and fathers did not only differ in their contribution to childcare but also in their working conditions. Table 1 shows that mothers reported more often to work in system-relevant occupations (53 and 59%) than fathers (42%) (for further details see Online Appendix and Zoch *et al.* 2020). In addition, fathers (50%) were far more likely to work from home than mothers of young pre-/schoolchildren (24%). Lastly, gender differences can also be observed for changes in working hours: About 23 and 16% of mothers extended their working hours in the first months of the pandemic, whereas this applies to only 10% of fathers. Furthermore, our results indicate that especially in families with younger children a high proportion of mothers (53%) and fathers (46%) had to reduce their working hours. While 62% of fathers explained their reduced working hours with mandatory short-time work (*Kurzarbeit*), mothers stated unpaid or paid exemption (*Freistellung*) and reduction of overtime as the three most frequent reasons (see Table A3 in the Online Appendix). Unfortunately, our data do not allow to differentiate whether this exemption was chosen voluntarily by mothers in order to reconcile childcare and work.

Care-arrangements in families with a schoolchild around age 14

Multivariate results are presented using average marginal effects that represent the probability for each care-arrangement dependent on the independent variable, that is, the average change in probability for the respective category among all observations. Figure 2 shows the average marginal effects of selected independent variables on the four care-arrangements for mothers with a schoolchild from stepwise regression models.⁷

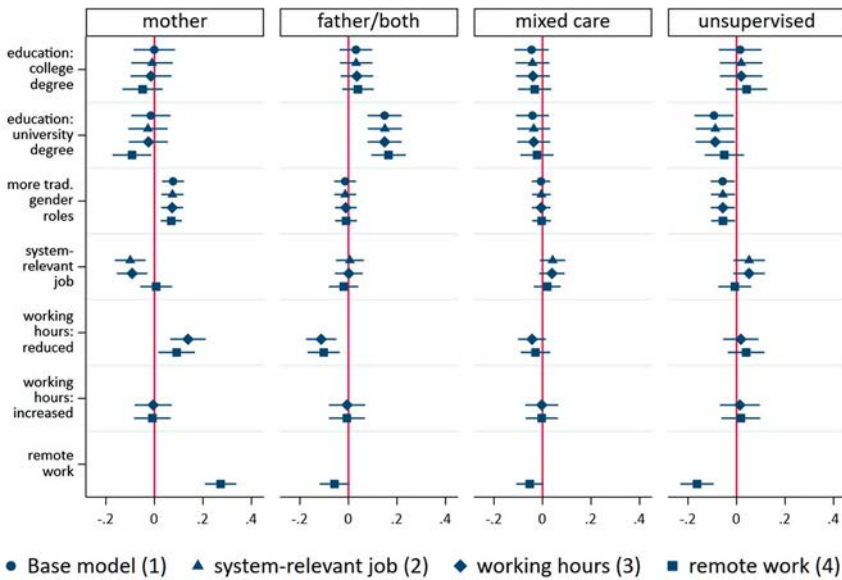
We included the education and gender roles of respondents measured before the pandemic to examine the extent to which respondents were involved in parental childcare based on their attitudes. Following the theoretical assumptions, a higher educational level of the mother was negatively associated with exclusive maternal care ($p = .024$) and positively related to fathers' or shared care ($p = .000$). Moreover, more traditional gender role attitudes of the mother were negatively associated with unsupervised children ($p = .027$), but instead positively linked to exclusive maternal care ($p = .002$).⁸

Regarding the working conditions, the results provided only partial support for *hypotheses 1–3*, presuming less involvement in family work when working in a system-relevant occupation, longer hours, or offsite instead of remotely. While a system-relevant occupation of the mother substantially decreased the likelihood of exclusive maternal care ($p = .002$ in model 2 and $p = .004$ in model 3), it was not substantially associated with father's involvement. Moreover, the effect vanished when we controlled for remote work (model 4) (see Online Appendix for crosstabs on working conditions).

In line with *hypothesis 2*, mother's reduced working hours were positively linked to exclusive maternal care ($p = .018$), whereas the relationship with fathers' or shared care was significantly negative ($p = .003$). Surprisingly, increased working hours of mothers did not reduce the likelihood of exclusive maternal care. The results therefore only partially support *hypothesis 2*.

⁷Confidence intervals crossing the vertical zero line indicate statistically insignificant effects. For all estimated models, the average marginal effects of all control variables, standard errors, and the number of observations are reported in the full and stepwise model in the Online Appendix.

⁸The results of the further controls are in line with theoretical considerations: The number of under-14-year-olds was positively associated with parental care, with a particularly pronounced link with exclusive maternal care. In addition, under-14-year-olds were less likely to remain unsupervised. Moreover, larger families were positively linked to mixed care-arrangements.



Source: NEPS-SC2, N=785

Figure 2. Care-arrangements of mothers with schoolchild (NEPS-SC2). *Source:* NEPS-SC2, B130_C1 & NEPS-Corona_CAWI_C2, own estimates.

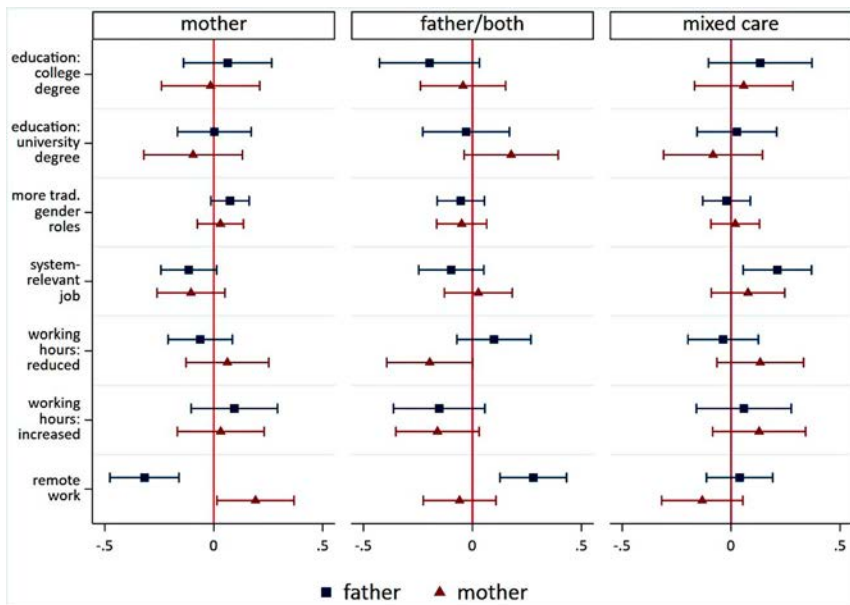
Note: Average marginal effects estimated by multinomial regression models. Additional control variables: mothers' age, mothers' migration background, household size, number of under-14-year-olds in the household, East Germany. See Table A8 in the Online Appendix for detailed regression results of the full model. Stepwise regression results are also included in the Online Appendix.

Lastly, in line with *hypothesis 3*, our models showed a strong positive relationship between the remote work of mothers and exclusive maternal care ($p = .000$). Moreover, the remote work of mothers was negatively linked to all other care-arrangements, especially to the child being unsupervised ($p = .000$), providing strong support for *hypothesis 3*.

Care-arrangements in families with a child below age 14

Figure 3 shows the average marginal effects of selected independent variables on three care-arrangements for mothers and fathers with a school or pre-school child below age 14.⁹ Again, we first examined the extent to which respondents were involved in parental childcare based on their attitudes. For both mothers and fathers, it was mainly the more traditional gender role attitudes that were associated with different care-

⁹Given the younger age of the child, the number of unsupervised children was too small to consider a separate category.



Source: NEPS-SC6, N=139 mothers/156 fathers

Figure 3. Care-arrangements of parents with pre-school or schoolchild (mothers and fathers, NEPS-SC6). Source: NEPS-SC6, B145_C1 & NEPS-Corona_CAWI_C2, own estimates.

Note: Average marginal effects estimated by multinomial regression models. Additional control variables: age, migration background, household size, number of under-6-year-olds and under-14-year-olds in the household, East Germany. See Table A8 in the Online Appendix for detailed regression results of the full model. Stepwise regression results are also included in the Online Appendix.

arrangements. While the relationship between traditional work-care norms and fathers' or shared care was negative, the association was positive for exclusive maternal care ($p = .096$ for fathers).

Considering the working conditions, we again find only partial support for *hypothesis 1*, assuming a smaller share of family work for parents working in a system-relevant occupation. For both parents, a system-relevant occupation was somewhat negatively associated with exclusive maternal care ($p = .078$ for fathers) and increased the likelihood for using a mixed care-arrangement, particularly for fathers ($p = .008$).

In line with *hypothesis 2*, fathers increased working hours were negatively associated with paternal or shared care and instead positively linked to exclusive maternal care. For mothers, however, increased working hours did not come along with a lower probability of exclusive maternal care. Nevertheless, they were negatively linked to shared care ($p = .100$) and positively linked to mixed care-arrangements. Moreover, in line with *hypothesis 2*, reduced working hours, increased the

likelihood of parental involvement for fathers as well as for mothers. Furthermore, reduced working hours reduced the involvement of the partner, especially when mothers reduced their work volume ($p = .052$).

Lastly, the relationship between remote work and the care-arrangement provided some additional support for gender inequalities in the short-term division of family work. For fathers, the relationship between remote work and own or shared care was positive ($p = .000$) and again negative for exclusive maternal care ($p = .000$). For mothers, however, remote work was positively associated with maternal care ($p = .034$) but again not substantially linked to paternal or shared care.

Discussion and Conclusion

By exploiting novel panel data from Germany, this study provides additional evidence on the short-term consequences of the COVID-19 pandemic-related closures of schools and institutional childcare for the care-arrangements of working parents. We find a traditional division of care work in families in Germany during the first months of the COVID-19 pandemic, with mothers acting as main caregivers in families with older as well as younger children. In addition, the data also revealed that a substantial part of older schoolchildren had to take care of themselves – a result that hints towards the significant challenge for parents to combine childcare, homeschooling, and working life during the crisis. Our results therefore align with the few initial panel studies highlighting the re-enforced gender inequalities in family work during the COVID-19 pandemic in Germany (Hank and Steinbach 2020; Kreyenfeld *et al.* 2020).

Furthermore, the results not only refer to gender differences in the contribution to childcare but also in pandemic-related altered working conditions, with mothers being more likely to work in a system-relevant occupation, to work onsite and to change their working hours compared to fathers. The multivariate findings point towards systematic gender differences in the relationship between parental working conditions and care-arrangements. Surprisingly, for mothers working in a system-relevant occupation, longer hours or onsite rather than to work remotely was not associated with a higher likelihood for fathers' or shared care. Conversely, father's possibility to work remotely was negatively linked to exclusive maternal care, providing additional evidence to previous studies (Hank and Steinbach 2020). Overall, these gender differences suggest that working conditions have a positive influence on the bargaining power mostly for fathers but not for mothers.

However, given no information on the working conditions of the partner, we were unable to account for further important characteristics, which are likely to correlate with the chosen care-arrangements of couples. By exploiting pre-corona information and a range of individual and household level controls, we try to account for unobserved heterogeneity. However, due to other unobserved characteristics, especially partner characteristics, the risk of biased estimates remains. Moreover, the small sample sizes, especially for mothers and fathers with younger children, did not allow for further sub-sample analyses. Consequently, the investigation of further mechanisms is not possible and must therefore be the subject of future research.

Despite these limitations, our study provides additional insights into the altered care-arrangements of families with school and pre-school children during the first months of the pandemic. With panel data on parents that were all employed and using formal childcare before the start of the pandemic, our study highlights the importance of working conditions for reconciling work and family, particularly the possibility to reduce working hours and remote work. However, the results also show that these measures are still associated with a gendered division of care work, with women taking on the greater share of care. From a broader perspective, our findings support public concerns that the COVID-19 pandemic strengthens existing inequalities by forcing women out of the labour market and back into the domestic field. Against the background of the ongoing pandemic, employers and policy-makers need to better support parents and especially mothers, by further increasing paternal involvement.

Disclosure statement

No potential conflict of interest was reported by the author(s).

ORCID

Gundula Zoch  <http://orcid.org/0000-0002-4398-4535>

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