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# WORKING FROM HOME DURING COVID-19 PANDEMIC AND CHANGES TO FERTILITY INTENTIONS AMONG PARENTS

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## Working from home during Covid-19 pandemic and changes to fertility intentions among parents

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**Abstract:** The Covid-19 pandemic and related massive spread of home based work led to substantial changes in the conditions for combining work and childbearing. On the one hand, working from home helped parents to accommodate increased childcare needs. On the other, it led to blurred boundaries between work and family life during lockdowns. We investigate how working from home was related to change in fertility intentions of mothers and fathers during the pandemic and discuss the complex mechanisms behind these relationships. With the use of unique Familydemic Survey data for Poland, we estimate multinomial logit regressions and consider a set of potential moderators. We find evidence for an overall negative relationship between home based work and fertility intentions for mothers and fathers, but we also uncover some positive moderating effects. In particular, we shed light on the unexpected moderating role of gendered division of unpaid labor from before the pandemic.

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**Keywords:** fertility intentions, childbearing decisions, Covid-19 pandemic, coronavirus pandemic, working from home, telecommuting, telework, home based work, work-family reconciliation, work-family conflict, parents, gender relations, division of unpaid work

**JEL codes:** J13

**Data availability statement:** The dataset we are using is not yet publicly available. It comes from a CAWI survey carried out on a representative sample from the Polish population within the frames of the project funded by the National Science Center in Poland (PI - Anna Kurowska). After the end of the project the dataset is planned to be made available for other uses.

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## 1. Introduction

The outbreak of the Covid-19 pandemic has brought a sharp decline in the TFR in late 2020 and early 2021 (Aassve et al. 2021, Sobotka et al 2021, Wilde et al 2020), though this negative trend reversed for some countries in the second half of 2021 (UNFPA 2021, Sobotka et al 2021, Aassve et al. 2021, Zeman and Sobotka 2021). Several studies attempted to explain the mechanisms behind these developments, referring to the apparent increase in economic uncertainty (e.g. Guetto et al. 2020), job and income loss or deterioration of career prospects (e.g. Luppi et al 2020), sudden termination of infertility treatment (e.g. Tippet 2021) and access to external childcare (Aassve et al. 2020). No study, however, has yet looked at the role of home-based work (HBW hereafter), which became widespread during the Covid-19 pandemic, and fertility (intentions). This is quite an oversight since the massive spread of HBW has been one of the major and most universal changes that the Covid-19 pandemic has brought to workers' lives. On average, the share of employees working from home in the EU in 2020 more than doubled compared to 2019 (Eurostat 2021) and within the group of 18-34 year olds exceeded 50% of employees (CSO 2021). This enormous and rapid increase in HBW together with lockdowns and school closures have completely changed the conditions of combining paid work and care during the pandemic (e.g. Adisa et al. 2021) and could have consequently affected worker's fertility intentions, and further, their realizations.

The possibility to work from home is potentially an important determinant of fertility since it affects the conditions of combining paid work and care and career opportunities of home-based workers. On the one hand, home-based work may facilitate fertility as it may support the reconciliation of paid work and care by allowing workers to save on commuting time or organizing paid work more flexibly around family obligations (Chung and Van der Lippe 2018, Crosbie and Moore 2004). On the other hand, however, it may also work in the opposite direction, exacerbating work-family conflict by blurring the boundaries between paid work and family life (Glavin and Schieman 2012) and having negative consequences for workers' career opportunities by influencing their productivity, interaction with colleagues and promotion opportunities (Munsch 2016, Kasperska 2021). The only two studies that have been conducted so far on the topic in the pre-pandemic period suggest that 'the possibility to work from home at least some time' is indeed important for fertility decisions (Sinyavskaya and Billingsley 2015) though its influence strongly depends on woman's family and work context (Osiewalska et al 2022). Most importantly, HBW

was found to be positively correlated with childbearing but under the condition that it was really helpful for work-family reconciliation, e.g. enabled substantial savings on commuting time or was used by those mothers, whose partners perform relatively little childcare (Osiewalska et al 2022). In the light of these arguments, the rapid spread of HBW since March 2020 might have opened new opportunities for childbearing. At the same time, the pandemic and the related lockdowns and school closures have exacerbated numerous risks related to HBW. It has been widely demonstrated that workers who had the possibility to perform their jobs at home during the pandemic had to simultaneously take care of children during school closures, which resulted in higher mental load, lack of sleep, work interruptions and increased risk of multitasking (Adisa et al 2021).

In this paper, we investigate how the change in access and frequency of use of HBW that took place between February 2020 and June 2021 are related to changes (increase or decrease) in fertility intentions (FI hereafter) of parents. This relatively long timespan enables us to assume that people have already had enough time to experience what HBW entails (if they had an opportunity to work from home) for work-family reconciliation, work life balance and their professional careers during the specific, pandemic period. Therefore, our findings would not reflect peoples' reactions to the first pandemic shock, but rather a mid/long term consequence of working from home during the pandemic times. Our focus is on parents of at least one child since they were able to make a full-scale experience of what it means to combine HBW with childcare and thus make fully informed changes in their subsequent fertility plans. Our study is conducted for Poland. This country in the pre-pandemic period was characterized by relatively low fertility rates (Eurostat 2019a), and in particular low progression to second and higher order births, which did not reflect the desired family size of Poles (CBOS 2019). Moreover, it also displayed rare access to and use of home based work (Eurostat 2019b). This means that the studied population had a considerable potential for change in both aspects: beginning to actually work from home as well as increasing their intention to have another child (although also a decline was still possible). Furthermore, it is a country with relatively low access to childcare, low incidence of part-time work and fairly inflexible work hours (Eurostat 2020, Eurofund 2020), thus possibility to work from home, induced by the pandemic, could have been perceived by parents as a convenient solution. At the same time, however, women in Poland bear a disproportionately high responsibility for childcare (Suwada 2021), and thus a need to simultaneously work and take care of children at home during remote learning could have been a particular challenge for many of them. All this suggests that the

opportunity to work from home might be both positively as well as negatively related to changes in fertility intentions of Poles during the pandemic.

This study has several contributions. It is the first study to explore the links between HBW and fertility (intentions) in the pandemic period and contributes to the scarce literature on these links from before the pandemic. It helps to better understand the role of specific circumstances for the direction of the impact of HBW on fertility decisions, both from the macro level (e.g. lockdowns, confinement measures, remote learning) as well as micro/individual level (e.g. financial situation of the family or partner's engagement in unpaid work). More specifically, it contributes to two major strands in the literature. First, it is the growing literature on the implications of the pandemic for fertility developments, which has already pointed at the role of uncertainty (e.g. Guetto et al. 2020), job and income loss or deterioration of career prospects (e.g. Luppi et al 2020), sudden termination of infertility treatment (e.g. Tippet 2021) and access to external childcare (Aassve et al. 2020) for fertility decisions, but has not yet explored the role of HBW. Second, it is the vast literature on HBW, which outlines numerous consequences of this work arrangement for workers' life, such as work-family balance, psychological well-being and health (Gajendran and Harrison 2007, Demerouti et al. 2014), time use (Powell and Craig 2015), working conditions or work careers (Arntz et al. 2019, Chung and van der Horst 2018), but has rarely explored fertility (intentions) as an outcome so far. Exploring the role of HBW for fertility decisions is particularly important as the expansive use of HBW may not end with the Covid-19 pandemic, but become a new standard or at least an option for a substantial share of employees (ILO 2020). The consequences of HBW on people's lives may thus be widespread, long lasting, and understanding better the conditions that foster positive or negative effects of HBW on fertility decisions surely deserves special research attention.

## **2. Theoretical framework and hypotheses**

The most straightforward mechanism behind the influence of HBW on fertility decisions are the opportunities this work arrangement creates for combining paid work and family. These opportunities can be particularly appreciated by parents if they have the possibility to work from home and experience what it means for combining paid work and care. Parents may increase their fertility intentions if they are able to work from home as HBW may help to relax time constraints, reduce commuting times and allow more time to be devoted to family life (Chung and Van der Lippe 2018). Working from home may also allow working parents to organize paid work around

childcare and housework which would not be possible if they would work from the office, i.e. to perform paid work in parallel to some household tasks (e.g. laundry or cooking) after initiating them (Hill et al. 2003, Bailey and Kurland 2002), when children sleep (Chung and Van der Lippe 2018, Powell and Craig 2015) or are old enough to manage on their own without supervision (Callister and Singley 2004). Qualitative studies suggest that women who work from home choose this work arrangement to accommodate paid work and family demands (Sullivan and Lewis, 2001, Hilbrecht et al., 2008). Some studies also show that HBW may lead to higher work-life balance (Crosbie and Moore 2004, Felstead et al. 2002). What is more, HBW brings material gains too. People who work from home can save money for some future child-related expenses, which they would otherwise spend on transport or office dressing (Raiborn and Butler 2009, Madsen 2003). But HBW may also have negative effects on the work-family nexus and thus negatively impact fertility (intentions). First of all, HBW may exacerbate the work-family conflict, by blurring boundaries between paid work and family life and experiencing higher paid or unpaid workload (Kurowska 2018, Glavin and Schieman 2012). No clear setting of the beginning and the end of the working day and no physical boundaries between the workplace and the home may result in the negative spillover from one sphere to the other (Glavin and Schieman 2012, Lott 2018). Studies showed that HBW can lead to longer working hours (Eurofound and ILO 2017, Chung and Van der Horst 2018), more multitasking and time fragmentation - particularly among women (Powell and Craig 2015, Hill et al. 2003) - and (as a result) higher mental load (Eurofound 2020, Gadeyne et al. 2018). All this creates unfavorable conditions for making childbearing decisions and may negatively impact fertility intentions.

All in all, the overall effect of HBW on fertility intentions depends on the circumstances, which may foster the dominance of either positive or negative effects or cancel both effects out (Osiewalska et al. 2022). Looking first at the overall specificity of the pandemic period, we argue that the Covid-19 pandemic related lockdowns, school and childcare closures followed by widespread moves towards remote learning, even for the youngest children, as well as frequent individual and familial quarantines created a situation in which the negative effects of HBW on the work-family nexus of parents dominated (outweighed the positive ones). People were faced with the need to simultaneously combine paid work and childcare or/and homeschooling at their homes. This resulted in an immense increase in unpaid tasks, work fragmentation, multitasking and mental-load (e.g. Hjalmsdottir et al. 2021; Raile et al. 2021). Limited possibilities of outsourcing

not only childcare but also housework (due to confinement measures) created additional burden on families. Mothers were the ones to bear the most of it (see e.g. Meraviglia and Dudka 2021, Zamberlan et al. 2021, Manzo and Minello 2020), but fathers have also increased their engagement in unpaid work during the pandemic (see e.g. Derndorfer et al. 2021, Farre et al. 2021). These experiences have been shared by large parts of the population across all countries. These considerations lead us to an expectation that in contrast to the overall positive effects of HBW on fertility intentions (Sinyavskaya and Billingsley 2015) or no main effects on second births (Osiewalska et al. 2022) found in studies conducted before 2020, we will find overall negative effects of HBW on fertility intentions among mothers as well as fathers (although to a lesser extent among the latter) during the coronavirus pandemic. In other words, we expect that during the pandemic the negative effects of HBW for fertility intentions among parents would - on average - dominate over the potential positive effects that HBW could have. Therefore, the first hypothesis we formulate is the following:

**2.1 Hypothesis 1:** *The overall relationship between HBW and fertility intentions among parents during the Covid-19 pandemic was negative (H1a), at least among mothers (H1b). In other words, we expect that fertility intentions of parents (mothers in particular) who worked from home declined more strongly or increased less strongly than fertility intentions of their office-based counterparts.*

However, numerous confinement policies that accompanied distortions to childcare during the Covid-19 pandemic (particularly during lockdowns), led to employment and income instability (Brugavini et al. 2021, Fana et al. 2020) and thus to (additional) economic strain on families. For those parents who suffered financially during this period, HBW might have been perceived as a particularly convenient working arrangement that helped them save on commuting and office dressing and thus resist the economic hardship caused by the pandemic and accommodate future child-related needs. It has been shown that money savings have been one of the important advantages of working from home for people during the pandemic (Kučera et al. 2021, Rubin et al. 2020), and that financial savings from HBW were indeed substantial (Beno 2021). We therefore expect that:

**2.2 Hypothesis 2:** *Among parents whose financial situation deteriorated during Covid-19 pandemic, HBW might have brought enough positive gains that canceled out or even outweigh the*



*negative effects of HBW on fertility intentions during the pandemic. Therefore, we expect to find no negative effect, or even positive effect of HBW among parents whose financial situation deteriorated during the pandemic.*

In our main hypothesis, we expect to find a negative relationship between HBW and fertility intentions among mothers, as they were the ones to bear the most of the additional unpaid work during the pandemic (e.g. Sevilla and Smith 2020). However, for those mothers, whose partners had already been involved in sharing childcare duties before the pandemic, the increase in unpaid work during the pandemic was likely smaller than for mothers who shouldered the majority of childcare responsibilities before the pandemic. It has been shown that in countries with more equal division of labor, women were less burdened with pandemic-related unpaid work than in other countries (Del Boca et al. 2021) as their partners took over part of the new responsibilities which emerged with the closure of childcare centers and schools. Lower overall increase in unpaid work - childcare in particular - while working from home would likely mean weaker negative effects on fertility intentions among women living in more egalitarian partnerships. We thus expect that:

**2.3 Hypothesis 3:** *The negative impact of HBW on fertility intentions during the pandemic was weaker among mothers who shared childcare more equally with their partners already before the pandemic than among mothers who were fully/mostly responsible for unpaid work.*

Finally, while for some women, work may be perceived as a parallel career to childbearing, for other women it may seem as an alternative life path to employment, particularly when their jobs are unsatisfactory. Consistently with the New Home Economics (Becker 1993), losing/resigning from an unsatisfactory job in such circumstances may imply low opportunity costs and enlarging the family size may provide a woman with better self-fulfillment and in fact higher satisfaction (Friedman et al. 1994). Lockdowns and confinement policies during Covid-19 pandemic have enforced HBW across different sectors, branches and occupations. But not for all occupations working from home is a convenient/suitable working arrangement. While for managers and professionals working from home is amenable (and thus these occupational groups had the highest proportion of workers reporting doing at least some usual hours from home already before the pandemic), for other occupational groups working from home may not be equally convenient (Dockery and Bawa 2020, Holgersen et al. 2021). Professional and managerial positions are characterized by high levels of job autonomy, in contrast to other occupational groups. And

according to a meta-analysis by Gajendran and Harrison (2007) the effect of HBW on job satisfaction is to be fully mediated via autonomy. At the same time intensity/frequency of HBW may also have an impact on job satisfaction. Extensive use of HBW can increase isolation and frustration, which in turn leads to lower job satisfaction (Mergener and Mansfeld 2021, Golden 2006). Referring to the effect of HBW intensity/frequency on job satisfaction Golden and Veiga (2005) argue that with little autonomy, the increase in job satisfaction for low levels of HBW intensity would be weaker while the decrease in job satisfaction for higher levels of HBW intensity would be stronger compared to HBW users with more autonomy. Therefore, we can expect that for non-managerial and non-professional workers frequent and prolonged HBW arrangement could have been particularly detrimental for job satisfaction. For mothers, holding jobs characterized by low autonomy, which do not profit them or are not suited to be executed from home, being stuck at home working intensively for a long period of time and combining this effort with childcare might have resulted in significant drop in their work satisfaction and lead to increased fertility intentions as a way to opt out from working by turning to childbearing. As a result of these considerations, we expect that:

**2.4 Hypothesis 4.** *Among mothers holding non-professional/non-managerial positions, prolonged, frequent work from home will be positively related to fertility intentions, as these mothers will probably opt out from work for the sake of better fulfillment through subsequent childbearing.*

### 3. Country context

Our study is located in Poland which has been the lowest low fertility country for more than two decades with the total fertility rate oscillating between 1.3-1.4 throughout the 2000s and 2010s. Low fertility has been largely driven by low progression to second and higher order births (Sobotka and Fuernkranz-Prskawetz 2020, Rossa and Palma 2020). It persisted despite the fact that the economic recession, which took place in Europe between 2008 – 2012, was relatively mild in Poland and that the country entered a track of fast economic growth in the following years. While other post-socialist countries experienced substantial improvements in their fertility rates, the TFR in Poland hovered below 1.4 till 2016 when it rose to 1.48 to start declining gradually in the following years.

Household financial needs are one of the most important reasons for this persistence of low fertility. Low salaries, insufficient for purchasing a larger apartment and covering childcare related

expenses, have been repeatedly enumerated as important barriers to family formation (Suwada 2019, Marczak et al. 2018). The introduction of generous family transfers in 2016, under the “500+ Programme”, might have eased some of these financial tensions. The programme replaced the heavily means-tested family benefit, which was granted to families in the highest need, by a universal cash transfer of 500 PLN (around 120 EUR) paid monthly for each child in the family (Lendvai-Bainton and Szelewa 2020). Nonetheless, economic activity remains one of the most important sources of income for families (GUS 2021). Importantly, women's earnings substantially improve households' economic situation: the disposable income of the single earner household constituted only around 60% of the income of the dual earner household (Osiewalska 2019) and the proportion of female breadwinner couples in Poland is one of the highest in Europe (Vitali and Arpino 2016).

Despite the fact that women's economic activity may substantially improve households' financial situation and thereby improve the conditions for family formation, the conditions for work and family reconciliation in Poland are very poor (Matysiak and Węziak-Białowolska 2016) and were often mentioned as an important barrier to partner's reproductive choices (Kotowska et al. 2008, Mishtal 2012). Poland has one of the lowest enrolment rates in creches and kindergartens among the OECD countries, with only slightly more than 10% of children below 3 attending creches just before the pandemic (OECD Family Database 2022). In the absence of places in childcare centers parents often benefit from the support of their relatives, mostly grandparents (Bordone et al. 2017). At the same time, it is uncommon to combine childcare with part-time employment. Until the pandemic employees had relatively little flexibility when it comes to the organization of their working time or working from home (Eurostat 2020). Specifically, in 2019, i.e. just before the outbreak of the pandemic, less than 10% of employees in Poland worked from home at least occasionally, while in Nordic countries this proportion was already exceeding 25% (Eurostat 2020). On top of that, Poland is characterized by a relatively traditional division of childcare duties: while social surveys consistently show that Polish women are expected to work for pay, they are also deemed mainly responsible for either providing or organizing childcare (Boehnke 2011).

In these circumstances, the possibility to work from home, which emerged during the pandemic, could, on the one hand, become an important solution for combining paid work and care for some Polish mothers and increase their fertility intentions. On the other hand, however, the

pandemic disorganized childcare arrangements of many parents and made combining paid work and care much more difficult. Those parents who received childcare support from grandparents suddenly had to give it up to protect the health of older family members. Moreover, access to childcare facilities became more difficult. All childcare facilities were fully closed during the first three months of the pandemic (March – May 2020). This changed in June 2021 but the facilities for the youngest children, below 3, were opened only partially and it was up to the director to decide how many children could be admitted to the childcare center and at which hours so that the social distancing rules were respected. Schools, in particular for children aged 10+, remained closed for most of the time and children had to attend classes remotely (see e.g. ECDC 2022). During the entire period under the analysis, any COVID-19 cases which were reported resulted in sending all the children from the class or kindergarten group into a quarantine which lasted 10-14 days. Children who displayed any symptoms of sickness - such as a running nose - which would usually go unnoticed, were asked to stay home. Parents of children aged 8 or less were offered a care allowance at 80% of their earnings if the childcare center was closed and the parent had to take time off from work in order to take care of the child (ECDC 2022). Because of the school closures both parents reported they spent more time on childcare, though women (33%) more often than men (21%) (Own computations based on Familydemic Data).

#### **4. Data and research sample**

In order to investigate the links between HBW and fertility intentions during the pandemic we make use of unique, representative data from the Familydemic Survey. The data was collected for Poland in June 2021 on a sample of women and men aged 20-59 drawn from the national online panel. The Familydemic Survey collected comprehensive information on the lives of respondents and their families over the time period starting just before the outbreak of COVID-19 till the time of the interview. Among others, it provides detailed information on the socio-economic characteristics and health status of respondents and their partners, partners' performance in the labor market before and during the pandemic with detailed information on whether the person had the possibility to work from home (every day or occasionally), partners' division of childcare and housework, availability of external childcare, time spent by children out of school / in remote schooling, data on respondents' attitudes toward work and family, gender role ideologies, satisfaction with family life and relations with the partner and obviously partners' fertility intentions pre-COVID and at the survey time. Having this rich information, we were able to

investigate the links between HBW and fertility plans after accounting for the fact that the pandemic turned many other aspects of respondents' lives upside down. This includes, among many, sudden changes in health status of respondents and their family members, labor market situation and ways of working, increase in difficulties in combining paid work and care, experience of school closures or difficulties with arranging external childcare.

To study the change in fertility intentions of mothers and fathers during the pandemic we focus on respondents at reproductive age (20 to 44 years old; the initial sample size of 3388 women and 2563 men). We select only those who were in heterosexual unions at the interview, as their fertility intentions are the closest to be realized and thus the most vulnerable to the change in external conditions caused by the outbreak of Covid-19 (2601 women and 1837 men). As we are interested in working arrangements (HBW) we further select those who were employed both before the pandemic and at the interview (1344 women and 1283 men). Furthermore, we excluded those respondents who were pregnant or whose partner was pregnant at the interview (around 5% of women and men). Lastly, we selected only those who already have at least one child and the final samples amount to 815 mothers and 881 fathers.

## 5. Method

Our response variable is built based on two questions on fertility intentions, from which one relates to the pre-pandemic times: *'Did you intend to have a child within the next 3 years before the outbreak of the pandemic (February 2020)?'*, and one concerns the current situation: *'Do you intend to have a child within the next 3 years?'*. The answer ranges from 1 - *'definitely not'* to 10 - *'definitely yes'*. Then, we measure the change in fertility intentions comparing current intentions with pre-pandemic intentions. These changes range from -9 for the highest decrease in fertility intentions to 9 for the highest increase. As such, all the negative values stand for the decrease in childbearing intentions, 0 stands for *'intentions hold the same'*, and all the positive values represent the *'increase in fertility intentions'*. For sensitivity analyses we also use wider intervals in our main models for identifying no change in fertility intentions (*'holding the same intentions'*) allowing the difference to range from -1 to 1.

Our key explanatory variable related to HBW is the change in access and frequency of use of HBW that took place between February 2020 and June 2021. The information on whether the respondent has only gained access to HBW during the pandemic we derive from two questions: 1) *'Did you have an opportunity to work from home before the outbreak of the Covid-19 pandemic?'*

(February 2020)', and 2) 'Do you currently have an opportunity to work from home?'. The information on (frequency of) actual use of HBW before the pandemic and at the moment of the interview we acquire by using two other questions: 1) 'How often did you work from home before the outbreak of the Covid-19 pandemic?' and 2) 'How often do you currently work from home?'. Based on these questions we identify people who: a) had no access to HBW prior the pandemic and still have not got it by the time of the interview ('no access - no access' category); b) those who had no access to HBW prior the pandemic but got it during the pandemic (no access - access); c) those who had access to HBW already (access - access); and d) those who had access to HBW before the pandemic but during the pandemic took advantage of it or intensified its use (access - access+). Respondents who have lost access to HBW during the pandemic were excluded from further analysis as they were too few to construct a separate category.

Using a multinomial logit model we regress the change in fertility intentions (*decrease, increase, holding the same*) against our main explanatory variable, i.e. change in the access and use of HBW.

As formulated in our hypotheses 2-4, we expect that the relationship between the change in FI and HBW access/use may be moderated by certain conditions. These include: worsening of the financial situation during the pandemic, the division of childcare in the family before the pandemic, and holding a non-managerial/non-professional occupation. We test the hypotheses related to these three covariates by interacting them with our main explanatory variable. We run our models separately for mothers and fathers.

We measure the division of childcare duties between partners by an index built based on questions: *Who in your household did the following childcare tasks before COVID-19?*. These tasks include physical care (e.g. bathing, feeding, putting to bed), playing/reading, helping with schoolwork, transport and accompaniment to activities, and general oversight and supervision. We then sum up the number of tasks which women do *always or usually*. As such, the childcare index takes values between 0 (equal division or a man does more) and 5 (a woman does all childcare). Second, the worsening of the financial situation is identified based on a choice of a statement: *Comparing the current situation with the month before COVID-19 the financial situation of my family somewhat deteriorated / deteriorated a lot*. Finally, occupation is identified using answers to a question: *What is your (main) occupation?* and coded using ISCO-08. To address our fifth

hypothesis we build a dummy variable where 1 indicates non-managerial or non-professional positions.

We account for many other changes in one's life related to both professional and family spheres that may influence childbearing intentions and the HBW status and thus confound the relationship between these two variables. We consider the change in partnership status (getting married) and worsening partnership quality (*Comparing the current situation with the month before COVID-19 my relationship with my partner: somewhat deteriorated / deteriorated a lot*). We also account for the duration of the use of HBW during the pandemic by the partner of the respondent (in months). Further, we control for Covid-19 health risk for a respondent and other household members (*Do any members of your household have a health condition that puts them at higher risk of poor outcomes from COVID-19?*). Finally, we control for housing conditions that are particularly important during the pandemic (*How sufficient is your housing for working from home or homeschooling?*), socio-economic status (educational level, difficulties to maintain the family on present HH's income), and age (20-24; 25-29; 30-34 - reference category; 35-39; 40-44). Among parents we additionally control for the number of children and the presence of children aged 0 to 1.

## 6. Results

### 6.1 Descriptives

Among the 1,700 respondents selected for our analysis of fertility intentions in Poland, more than 12% of women and 9% of men reported a decline in their fertility intentions as compared to the pre-pandemic times (Table 1). For another 9% of women and 11% of men fertility intentions increased in the analyzed period. The majority of those with increased fertility plans are at young reproductive age (20 to 34). The decrease is pronounced among those women and men who gained more frequent use of HBW during the pandemic (*access – access+*): 19% of those women and 13% of men decreased their childbearing plans (Table 2). Nevertheless, a substantial share of respondents who have gained access to HBW (*no access – access*) or more frequent use of HBW (*access – access+*) also increased their fertility intentions (10-13% of men and 5-13% of women).

**Table 1. The structure (in %) of respondents by fertility intentions, age, and gender in the Polish Familydemic database.**

Sex	Age	Fertility intentions			Sum
		hold the same	decreas e	increas e	
Mothers	20-24	62.96	22.22	14.81	100.00
	25-29	68.87	15.09	16.04	100.00
	30-34	72.98	16.53	10.48	100.00
	35-39	81.39	10.82	7.79	100.00
	40-44	93.18	3.98	2.84	100.00
	Sum	78.53	12.39	9.08	100.00
Fathers	20-24	75.00	4.17	20.83	100.00
	25-29	70.24	13.10	16.67	100.00
	30-34	73.73	13.14	13.14	100.00
	35-39	79.12	9.16	11.72	100.00
	40-44	88.64	6.06	5.30	100.00
	Sum	79.57	9.53	10.90	100.00

Source: Own calculations based on Polish Familydemic database



**Table 2. The structure (in %) of respondents by fertility intentions, access to and use of home-based work (HBW), and gender in the Polish Familydemic database.**

Sex	Access to HBW	Fertility intentions			Sum
		hold the same	decrease	increase	
Mothers	no access - no access	80.86	10.11	9.03	100.00
	no access - access	68.75	18.75	12.50	100.00
	access - access	80.49	11.59	7.93	100.00
	access - access+	75.86	18.97	5.17	100.00
Fathers	no access - no access	80.80	8.48	10.73	100.00
	no access - access	77.98	11.93	10.09	100.00
	access - access	78.57	10.32	11.11	100.00
	access - access+	73.53	13.24	13.24	100.00

Source: Own calculations based on Polish Familydemic data

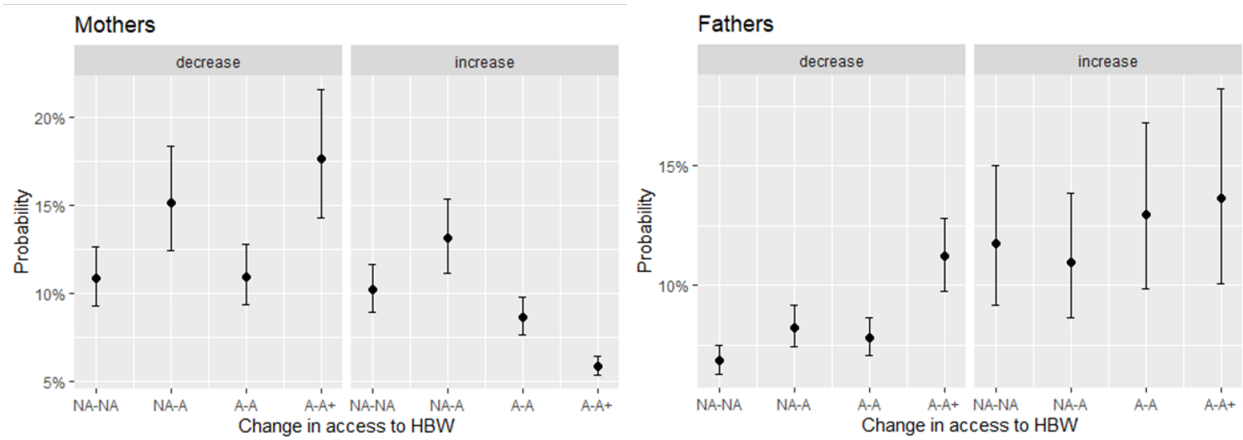
## 6.2 Regression

We estimated multinomial logit regressions with the dependent variable assuming three categories: increase in, decrease in or unchanged fertility intentions. We run our models by sex (women and men), accounting for the moderators and the control covariates (basic model). Next, we allow for interactions between our moderators and our main explanatory covariate, measured by change in access to and use of HBW. While interpreting our findings we refer to predicted probabilities (estimated marginal means) rather than to odds ratios, as they are recommended as the most accurate and straightforward inference in multinomial regressions (Paolino 2021, Wulff 2015). Estimated marginal means are interpreted as the predicted probability that the response (change in fertility intentions) takes a certain value (decrease, increase, hold the same) depending on the value of the selected explanatory covariate and averaged over all the remaining covariates. We evaluate whether the difference between two predicted probabilities is significant by comparing 83% confidence intervals. We do it following Austin and Hux (2002) who showed that two means differ from each other with the p-value at around 0.05 if 83% CI do not overlap.

## 6.3 Main effects

Based on the estimates of basic models for mothers and fathers we draw predicted probabilities (estimated marginal means) of a change in fertility intentions by change in access and use of HBW and present them with 83% confidence intervals on Figure 1. We find partial support for our first hypothesis stating that the overall relationship between HBW and fertility intentions is negative. Namely, a change to a more frequent use of HBW during the pandemic (from access to access+; hereafter A–A+) seems to be related to a decline in further childbearing plans. This finding is manifested in a lower predicted probability of increased FI for mothers (Figure 1, left-hand side) and higher probability of decreased FI among fathers (Figure 1, right-hand side) in comparison to those persons who did not have access to HBW before the pandemic and did not gain it (hereafter NA-NA). However, simply gaining access to HBW (a change from no access to access; hereafter NA-A) does not seem to be related to a significant change in fertility intentions.

**Figure 1. Predicted probabilities of decreasing and increasing fertility intentions by change in access to and use of HBW. Multinomial regressions by sex.**



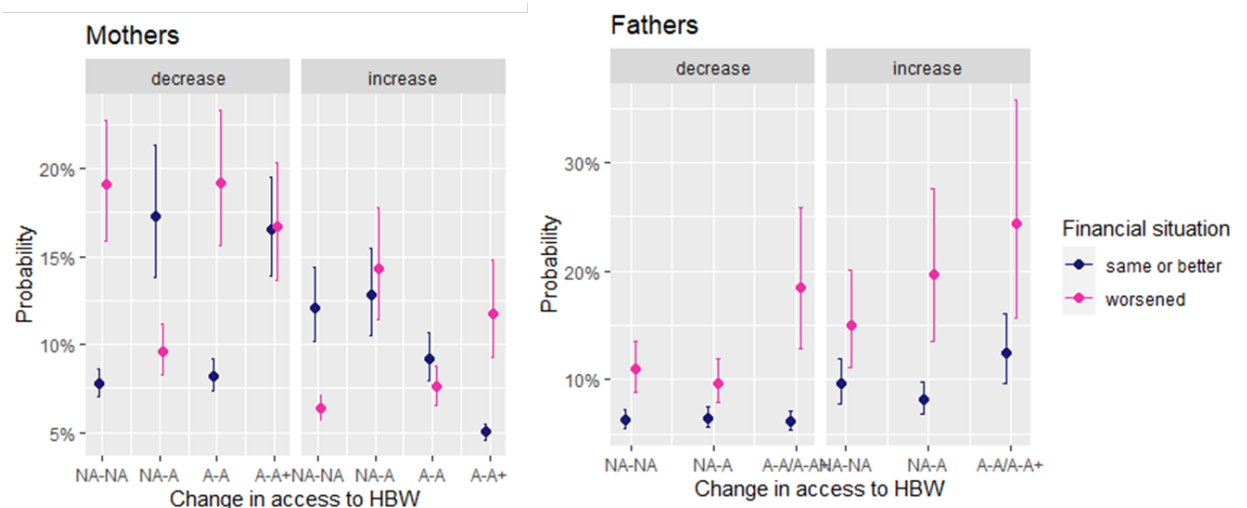
Source: Own calculations based on Polish Familydemic dataset.

#### 6.4 Worsened financial situation

Interactions with HBW bring some evidence that stays in line with our second hypothesis (H2) which expects that among parents whose financial situation has deteriorated during Covid-19 pandemic, HBW may bring enough positive gains to cancel out or even outweigh the negative effects of HBW on fertility intentions. Among mothers whose financial situation worsened (marked with pink color on Figure 2) but who newly gained access to HBW (NA–A) or use it more frequently (A–A+), the probability of increasing FI is higher than among those with worsened financial situation whose work-place arrangement has not changed (NA–NA). Furthermore, the newly gained access to HBW (NA–A) accompanied by worsened financial conditions of mothers is linked with a lower probability of decreasing FI than among on-site workers (NA–NA) (Figure 2, left-hand side). Our findings for fathers are in this case insignificant (Figure 2, right-hand side<sup>1</sup>).

<sup>1</sup> Due to the limited number of men who intensified HBW use (A–A+) and whose financial situation worsened during the pandemic, we combined this group with those who kept access to HBW (access – access, A–A).

**Figure 2. Predicted probabilities of decreasing and increasing fertility intentions by change in access and use of HBW and financial situation. Multinomial regressions by sex.**

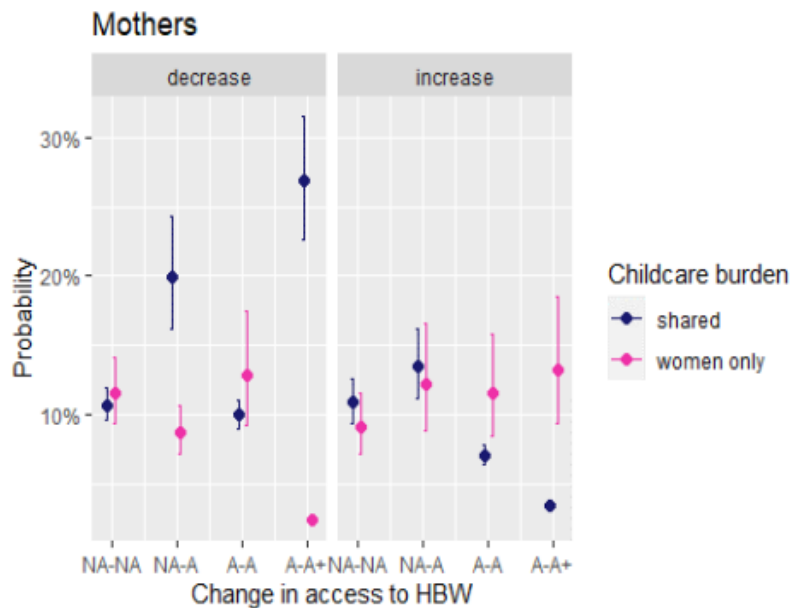


Source: Own calculations based on Polish Familydemic dataset.

### 6.5 Childcare burden before the pandemic

Our third hypothesis (H3) concerns mothers only and states that the negative impact of HBW on fertility intentions during the pandemic vanishes among women living in egalitarian unions, i.e. who shared childcare more equally with their partners before the pandemic. Our findings, however, stay in contrast with these expectations. We show that for mothers in egalitarian relationships there is a negative link between HBW and change in fertility intentions and it actually vanishes out for women, who did most of or all of the childcare already before the pandemic. To be specific, those who shared childcare duties with their partners and had access to HBW already before the pandemic (A–A) or who intensified its use (A–A+) are less likely to increase their childbearing plans than mothers with similar division of childcare having no access to HBW (NA–NA) (Figure 3). Moreover, mothers in egalitarian unions who either gained access to HBW (NA–A) or use it more frequently (A–A+) are more likely to decrease their fertility plans than their egalitarian counterparts with no access to HBW (NA–NA).

**Figure 3. Predicted probabilities of decreasing and increasing fertility intentions by change in access and use of HBW and childcare burden. Multinomial regression for mothers.**

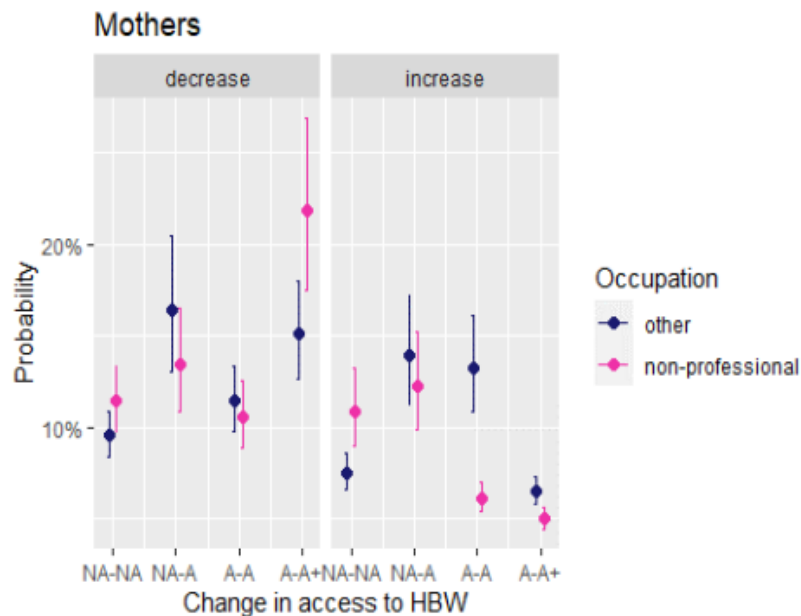


Source: Own calculations based on Polish Familydemic dataset.

### 6.6 Occupational position

Lastly, we expect that women holding non-professional/non-managerial positions who work from home are more likely to increase fertility intentions, as in this case they may more often opt out from work for the sake of better fulfillment through childbearing. We find, however, the opposite of what we expected. Namely, mothers who had access to HBW already (A–A) or use it more frequently (A–A+) in order to perform non-professional or non-managerial jobs at home are less likely to increase their childbearing intentions than their counterparts with similar occupational positions but working from the office (NA–NA, Figure 4). Those with intensified use of HBW (A–A+) in non-professionals or non-managerial jobs are also more likely to decrease FI than office-based mothers.

**Figure 4. Predicted probabilities of decreasing and increasing fertility intentions by change in the access and use of HBW and occupational position. Multinomial regression for mothers.**



Source: Own calculations based on Polish Familydemic dataset.

## 7. Discussion and conclusion

In this study we explored diverse aspects of working from home during the Covid-19 pandemic and their impact on fertility intentions among parents. As there may be both positive, as well as negative mechanisms linking home based work (HBW) and fertility intentions (FI), the overall effect depends on the circumstances. In our study we argued that the Covid-19 pandemic related lockdowns, school and childcare closures followed by widespread moves towards remote learning, even for the youngest children, as well as frequent individual and familial quarantines created a situation in which the negative effects of HBW on the work-family nexus could have - on average - dominated the positive ones. Parents were faced with the need to simultaneously combine paid work and childcare or/and homeschooling at their homes. This resulted in an immense increase in unpaid tasks, work fragmentation, multitasking and mental-load (e.g. Hjalmsdottir et al. 2021, Raile et al. 2021). Limited possibilities of outsourcing not only childcare but also housework (due to confinement measures) created additional burden on families. Women were the ones to bear the most of the additional burden of childcare and housework (see e.g. Meraviglia and Dudka 2021, Zamberlan et al. 2021; Manzo and Minello 2020), but men have also increased their engagement

in unpaid work during the pandemic (see e.g. Derndorfer et al. 2021, Farre et al 2021). These experiences have been shared by large parts of the population across all countries.

Our findings are partly in line with this general expectation. Namely, we found that mothers who made use of HBW on a larger scale during the pandemic than before, experienced a decline in their fertility intentions. Similar though insignificant decline was also observed for mothers who did not have access to HBW before but gained it during the pandemic. Our study thus shows that the pandemic context has accentuated the role of negative aspects of HBW for combining work and care. This might explain why our findings are in contrast to the findings of Sinyavskaya and Billingsley (2015) - the only previous, published study on the topic - that found a positive relationship between access to HBW and FI in the pre-pandemic period in Russia.

We have also explored particular situations, in which we expected the negative relationship between HBW and FI to be leveled out or even outweighed by other (positive) mechanisms. First, we argued that HBW might have been perceived as a particularly convenient solution during the pandemic in cases when the family has suffered financially during this period. It has been shown that money savings have been one of the important advantages of working from home for people during the pandemic (Kučera et al. 2021, Rubin et al. 2020), and that financial savings from HBW were indeed substantial (Beno 2021). Therefore, we expected that among individuals whose financial situation deteriorated during Covid-19 pandemic, HBW might have brought enough positive gains that canceled out or even outweighed the negative effects of HBW on fertility intentions during the pandemic. In our study we found partial support for this expectation, as the effect was significant only among mothers.

Second, we argued that mothers from families with more equal division of unpaid labor before the pandemic, could have been less burdened with additional unpaid duties than other mothers during the pandemic. Therefore, the negative effect of HBW on FI among them should be weaker. Our findings are in contrast to this expectation. We found a negative effect of HBW on FI among mothers who shared childcare duties with their partners before the pandemic while the negative effect was canceled out among those who did most of or all of the childcare duties already before the pandemic. There might be several reasons behind this state of affairs. In general, women who live in egalitarian or nearly egalitarian relationships may be used to the situation in which they share childcare duties equally with their partners or at least receive substantial support from them. They may even have more demanding jobs than other women, which simply do not allow them to

spend much time or energy on childcare and/or housework. Thus, a sudden increase in childcare-related duties, which they had to carry out during the pandemic while working from home, might have discouraged them from thinking about enlarging their families. This might have been the case even if their partners took over some of the additional childcare and housework which intensified during the pandemic. Numerous studies have shown, however, that the additional housework and childcare burden, which emerged during the pandemic, was primarily carried out by women, regardless of whether they previously lived in egalitarian relationships or not (Hank and Steinbach 2021, Meraviglia and Dudka 2021, Zamberlan et al. 2021, Manzo and Minello 2020) and regardless whether their male partners worked from home as well (Derndorfer et al. 2021). Mothers, from more traditional families in contrast to those from more egalitarian ones, might have been more used to the situation in which they have to carry out most of the childcare and housework and could more easily accept an increase in family-related responsibilities without questioning it (see e.g. Sullivan and Lewis 2001, Bailey and Kurland 2002, Hilbrecht et al. 2008). For them the possibility to work from home could emerge as a convenient solution for combining paid work and care. In fact, a study by Osiewalska et al (2022) from the pre-pandemic period in the UK showed that HBW is more likely to increase fertility of women who are primarily responsible for childcare. For these women, who cannot count on their partners, HBW might be the only way to reconcile economic activity with motherhood.

Finally, we also explored the situation of cumulation of negative effects of HBW on FI. We expected that for mothers holding jobs characterized by low autonomy, which are not suited to be executed from home, working from home while at the same time taking care of a child/children might have resulted in significant drop in their work satisfaction and - as a consequence - led to increased fertility intentions as a way to opt out from working by turning to childbearing. Our findings do not confirm these expectations. In fact, women working at non-managerial and non-professional positions (i.e. those characterized by low levels of autonomy), who obtained the possibility to work from home during the pandemic, turned out to lower their fertility intentions. We suppose this finding to be driven by financial reasons. Namely, women holding lower occupational positions may not be able to opt out from their jobs - even if they find them unsatisfactory - as their earnings may be an important source of income for their families. This finding may be particularly valid in the Polish context. It is because it is characterized by relatively low income levels and substantial contributions of women's incomes to the household budgets



(Klesment and Van Bavel 2017, Osiewalska 2019). But this finding may be increasingly relevant for other developed countries as well with the changing role of women in the society and increasing importance of women's income in the family (Vitali and Arpino 2016, Doepke et al. 2022).

This study has its limitations of which the most important are: the potential selection effects to employment and to HBW as well as some weaknesses of our measures of HBW. As for the first, some women and men may be more likely to be employed than others and some may be more eligible to HBW. These choices may relate to parenthood status and their subsequent fertility plans. Further, the pandemic hit some job sectors more than the others (e.g. service, sales) and working from home was also a solution for a limited number of workers. In order to reduce the selection bias, we control for SES which was shown to be an important determinant of one's ability to HBW during the pandemic (Dingel and Neiman 2020). Second, our main explanatory covariates, which defines whether the respondent received access to HBW during the pandemic, captures only two points in time: February 2020 and June 2021. We thus are not able to take into account potential changes in workplace arrangements that happened in between, e.g. we do not capture persons who gained access to HBW in mid 2020 but lost it half a year later.

Despite the limitations, our study provides an important contribution to literature on the complex interplay between work and family, shedding light on these relationships in the unprecedented times of the Covid-19 pandemic. It is the very first comprehensive study on the link between HBW and childbearing intentions, which not only provides novel empirical findings but also outlines a theoretical framework on how HBW may affect fertility intentions and behavior in the context of increased social uncertainty levels. It also helps to better understand the role of specific conditions for the direction of the link between HBW and fertility decisions. As such the study has a potential to stimulate future research, which will likely become widely discussed among demographers due to the growing body of literature pointing out numerous consequences of the pandemic on family development, including the role of uncertainty (e.g. Guetto et al. 2020), job and income loss (e.g. Luppi et al. 2020), termination of infertility treatment (e.g. Tippet 2021) and access to external childcare (Aassve et al. 2020). With this study we add another strand to this research by showing the importance of HBW for the change in fertility intentions during the pandemic.

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