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The Digital Shift: Working From Home and the Educational Gradient in Fertility Rates

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Abstract: The expansion of working from home (WFH) has transformed paid work, but access to remote-workable jobs remains strongly stratified by education. We examine how regional WFH availability is associated with fertility among women with different educational levels in Belgium. We link Belgian population register data (2001–2019) with regional WFH indicators from the Labour Force Survey and estimate discrete-time birth hazards, followed by microsimulation of aggregate fertility patterns. Higher WFH availability is associated with lower first-birth risks at younger ages across educational groups, with later recuperation only among highly educated women. For second and higher-order births, WFH availability is generally associated with higher birth risks, especially among the highly educated. Microsimulation shows that these parity-specific associations produce only modest changes in total fertility and the educational gradient. WFH therefore appears less as a universal reconciliation resource than as a stratified labour-market change with parity-specific fertility implications.

Keywords: working from home, remote work, fertility, educational gradient, parity progression microsimulation, register data, Belgium

JEL codes: J13, J11, J22, J24, O33, R23

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1. Introduction

Over the past three decades, the organization of paid work has been reshaped by the diffusion of information and communication technologies, the expansion of broadband infrastructure, and the growing use of digital tools for coordination and collaboration (OECD 2019; Piva and Vivarelli 2017). These developments have made it increasingly possible for paid work to be detached from the employer's premises and performed, at least partly, from home. Consequently, working from home (WFH) has become a visible element of contemporary labour markets and a realistic, socially recognizable way of organizing paid work for many employees (Barrero et al. 2021; Aksoy et al. 2022). This digital shift is particularly important for family formation by its potential to reduce incompatibilities between paid work and care. A large body of demographic research has shown that these incompatibilities contribute to delayed parenthood and reduced progression to subsequent births in advanced economies (Brewster and Rindfuss 2000; Engelhardt et al. 2004; Goldscheider et al. 2015). To the extent that WFH reduces commuting time and makes it easier to adjust the working day to family obligations, it may lower the everyday costs of combining employment and childrearing. At the same time, WFH may intensify work demands, blur the boundary between employment and private life, and shift more unpaid work into the working day, especially for women (Allen et al. 2013; Schieman et al. 2009; Demerouti et al. 2014). Hence, WFH may operate both as a facilitator and as a constraint for fertility.

The fertility implications of WFH are further complicated by the fact that access to and benefits of WFH are not uniformly distributed across workers (Lopes et al. 2017; Lu et al. 2023). Those with tertiary education are substantially more likely to hold jobs in sectors in which tasks can be performed remotely, such as ICT, finance, professional services, research, administration, and other knowledge-intensive activities (Dingel and Neiman 2020; Sostero et al. 2020). They may also have greater bargaining power to negotiate flexible arrangements and to transform WFH into a stable job resource. Workers with below tertiary education are more often employed in jobs requiring physical presence, including manufacturing, transportation, construction, retail, and many care and service occupations. When WFH is available to them, it may be embedded in more precarious or lower-paid forms of digital labour, where flexibility serves employers' cost-saving strategies rather than workers' work-family needs (Schor et al. 2020; Christiaens 2022). Thus, the same technological transformation that could make paid work more compatible with family life may also reinforce inequalities

in the conditions for having children and contribute to socioeconomic polarization in fertility behaviors.

Existing research has begun to examine how WFH is associated with fertility, but important gaps remain. Evidence is limited but suggests that the association between WFH and fertility varies by parity, education, and context. Studies on the United Kingdom show that home-based work is negatively associated with entry into motherhood but may be more favourable for higher-order births, especially among highly educated women (Osiewalska et al. 2024; Wang and Tan 2024; Osiewalska and Matysiak 2025). A similar socio-economic pattern has been observed in Norway, where the expansion of WFH during the first COVID-19 lockdown was followed by an increase in births, especially among high-earning women in previously inflexible jobs (Bratsberg and Walther 2025). Comparative evidence further indicates that WFH can facilitate births in supportive institutional contexts, but may be linked to postponement or lower fertility when combined with insecurity and weak reconciliation support (Osiewalska and Matysiak 2026). Finally, intention-based studies suggest that WFH is positively related to fertility intentions among women in Singapore and mothers in Russia, although comparative evidence also points to gender differences in the association between WFH and women's and men's fertility intentions (Sinyavskaya and Billingsley 2015; Wang and Dong 2024; Jansen 2025).

Two issues remain insufficiently addressed in previous research. First, existing studies usually focus on individuals' current WFH status, while less is known about whether the broader availability of remote-workable jobs shapes fertility. This distinction is important because regional WFH availability captures a labour-market opportunity structure: it reflects whether women live in contexts where remote work can become a realistic work–family strategy, even if they are not currently working from home. Second, previous studies rarely ask whether WFH effects translate into macro-level changes in the educational gradient in fertility. This is an important gap. While a micro-level association shows how WFH availability relates to the birth risk of an individual woman, it does not show whether the spread of WFH is large enough or located at ages and parities that matter for overall fertility.

This paper addresses these gaps by examining how the regional availability of jobs with high potential for WFH is associated with birth risks among women with different levels of education and how these associations aggregate into macro-level fertility patterns. We focus on Belgium, a country where WFH was already relatively widespread before the pandemic and has since become a central feature of the labour market. The share of employees working

at least occasionally from home increased from around 16% at the beginning of the 21st century to 36% in 2023 (Eurostat 2026a). We combine Belgian population register data for 2001–2019 with regional indicators of WFH availability derived from the Labour Force Survey. We estimate discrete-time hazard models for first, second, third, and higher-order births and allow the association between WFH availability and fertility to vary by education, age, and parity. We then use microsimulation to assess how changing regional availability of WFH may have contributed to the educational gradient in fertility under actual and counterfactual scenarios.

The contribution of the paper is threefold. First, we move beyond the question of whether individuals who work from home are more or less likely to have children and instead examine WFH as a regionally patterned opportunity structure. This approach captures the broader labour-market environment in which women make fertility decisions, including expectations about the availability of family-compatible employment. Second, we explicitly link micro-level mechanisms to macro-level fertility outcomes. By combining hazard models with microsimulation, we assess whether education-specific exposure and responses to WFH can reshape educational differences in fertility. Third, we place social stratification at the centre of the analysis. Rather than treating WFH as a universally available reconciliation tool, we investigate whether the digital transformation of work improves the conditions for childbearing mainly among the highly educated, while leaving lower-educated women with fewer opportunities to reconcile employment and family life.

2. Theoretical framework

2.1. Regional WFH availability as a stratified opportunity structure

The spread of working from home is often discussed as an individual-level arrangement: a worker either has access to it or not, uses it often or rarely, benefits from it or experiences it as a burden (compare, e.g., Osiewalska et al. 2024; Wang and Tan 2024). In this paper, we take a broader view. We conceptualize WFH as part of a digital reorganization of labour markets that changes the opportunity structure within which fertility decisions are made. This perspective shifts the theoretical focus from WFH as a private coping strategy to WFH availability as a structural condition. A region with many teleworkable jobs offers a different set of possibilities than a region where employment remains strongly tied to fixed workplaces and physical presence (Dingel and Neiman 2020; Sostero et al. 2020). Such possibilities may shape fertility even among those who are not working from home at a given moment. They may

affect expectations about future employment, perceptions of whether motherhood can be combined with career continuity, partners' employment conditions, and local norms about whether remote work is an acceptable or stigmatized form of organizing paid labour (Golden and Eddleston 2020; Vignoli et al. 2020). In this sense, WFH availability is not only a job characteristic. It is a feature of local labour markets that may become demographically relevant when it changes the perceived and actual compatibility between paid work and family life.

WFH availability is particularly important for understanding the educational gradient in fertility. Research on skill-biased technological change and occupational polarization shows that digital technologies transform jobs unevenly across the labour market, often strengthening the position of highly skilled workers while reducing or restructuring demand for more routine work (Acemoglu and Autor 2011; Goos et al. 2014; Autor 2015). Research on teleworkability similarly shows that jobs that can be performed from home are disproportionately concentrated among higher-paid, professional, and more highly educated workers (Dingel and Neiman 2020; Bonacini et al. 2021). The expansion of WFH is therefore unlikely to alter fertility uniformly across the educational groups. For highly educated women, high regional WFH availability may signal access to a growing segment of potentially family-compatible employment. For lower-educated women, however, it may indicate that local employment growth is concentrated in jobs for which they are less eligible, implying relatively weaker opportunities in the regional labour market.

We therefore next discuss how WFH may operate as either a resource or a strain, and why this balance is likely to differ for highly and lower-educated women at different stages of family formation. We then turn to the aggregate consequences of WFH, asking whether these education-specific mechanisms translate into changes in the educational gradient in fertility rates.

2.2. WFH and childbearing: individual mechanisms by education and parity

Theories of work–family reconciliation provide two competing expectations about the fertility implications of WFH. On the one hand, WFH availability may operate as a resource. In work–family border theory, work and family are distinct but interconnected domains separated by spatial, temporal, and psychological boundaries (Clark 2000). By moving paid work into the home, WFH makes these boundaries more flexible. It may reduce commuting time, facilitate movement between paid work and care, and allow workers to adjust the timing and location of tasks to family obligations (Bai et al. 2021; Hill et al. 2003). Similarly, the Job

Demands–Resources framework treats autonomy over the workplace as a resource that helps workers cope with increased work or family demands (Demerouti et al. 2001; Bakker and Demerouti 2007). From this perspective, WFH availability may lower the opportunity costs of childbearing by making employment continuity more compatible with motherhood.

On the other hand, the same arrangement may operate as a strain. Work–family border theory also emphasizes that greater flexibility often comes with greater permeability: work may intrude into family time, while family demands interrupt paid work (Allen et al. 2013; Glavin and Schieman 2012). The flexibility paradox and the stress-of-higher-status hypothesis further suggest that autonomy over the workplace may generate longer hours, work intensification, constant availability, and stronger responsibility for output (Schieman et al. 2009; Chung 2022). In this case, WFH may not reduce work–family conflict but relocate it into the household. It may also increase women’s unpaid workload if family members treat physical presence at home as availability for domestic tasks (Ammons and Markham 2004; Chung and Booker 2023). Whether WFH availability supports or discourages childbearing therefore depends on whether it is experienced as a resource or as intensified demands.

For highly educated women, both mechanisms are plausible, though most likely at different parities. On the resource side, highly educated women often work in occupations where WFH is technically feasible and organizationally accepted, with low career penalties attached to these work arrangements (Munsch 2016). They may also have more bargaining power, stronger employment protection, and greater control over how work is performed. These resources can transform higher WFH availability into higher opportunities to sustain labour-market attachment around childbirth, better coordinate work and care, and thus reduce the opportunity costs of having children (Chung and van der Horst 2018; Lu et al. 2023; Osiewalska et al. 2024). On the strain side, jobs of highly educated women often involve complex tasks, career competition, individual responsibility, and expectations of high commitment (Blair-Loy 2003; Schieman et al. 2009). WFH may therefore encourage work devotion during career-building years, thereby reinforcing the postponement of childbearing. The strain mechanism is more likely to concern younger or childless women, for whom WFH availability may support further career investment before the transition to motherhood. Among mothers, who already know the practical demands of childcare, the availability of WFH may more readily operate as a resource that improves work–family reconciliation and reduces the cost of another child. Previous research on work autonomy found precisely this duality: among highly educated women, WFH use was negatively associated with entry into

motherhood but positively associated with the transition to a second child (Osiewalska and Matysiak 2025). This suggests that WFH availability may be associated with delayed first births among younger, highly educated women, while facilitating recuperation or family enlargement later in the life course, once career foundations are more secure and the need for reconciliation becomes more immediate.

For lower-educated women, the mechanisms are different. Their jobs are more often tied to physical presence, direct service provision, or location-specific equipment. Higher regional availability of WFH may therefore signal a labour market increasingly oriented toward jobs from which they are only weakly able to benefit. More importantly, in regions where remote-workable employment expands primarily in high-skilled sectors, lower-educated women may face relatively shrinking employment opportunities, weaker labour-market attachment, or greater employment uncertainty (Acemoglu and Autor 2011; Kalleberg 2011). In this case, WFH availability would not represent a reconciliation resource, but rather a marker of structural labour-market change that may undermine the economic conditions for family formation. Furthermore, even when remote work is available to lower-educated workers, it may be less secure and less autonomous (Harknett et al. 2024; Kalleberg 2011). In platform work, subcontracted digital labour, or low-paid home-based service jobs, WFH may mean unstable hours, weak social protection, and dependence on employers or clients rather than actual control over the workplace (Schor et al. 2020; Christiaens 2022). In such settings, WFH availability is unlikely to reduce the economic and organizational barriers to entering parenthood or to progressing to additional births. It may instead be associated with insecurity or limited access to stable family-compatible employment.

Overall, WFH availability may generate different fertility responses by education, age, and parity. Among highly educated women, it may be associated with postponement of first births at younger ages, later recuperation, and stronger progression to second or higher-order births. Among lower-educated women, limited access to secure and autonomous remote-workable employment may lead to weaker benefits or even drawbacks at all parities.

2.3. From education-specific birth risks to aggregate fertility gradients

The mechanisms linking WFH to childbearing operate at the individual level, but their demographic significance depends on how these associations aggregate across educational groups, ages, and parities. In contemporary Europe, fertility remains stratified by education, although the gradient varies. Low-educated women still display the highest fertility in many

countries, yet in around one-third of European countries – including Belgium – the period fertility gradient is U-shaped, with the lowest fertility among medium-educated women (Greulich and Toulemon 2023). Parity-specific evidence further shows that highly educated women are more likely to postpone or forego entry into parenthood, while educational gradients in progression to second and higher-order births vary considerably across institutional contexts, being most positive in Northern Europe and most negative in Central and Eastern European countries (Wood et al. 2014; Brzozowska et al. 2022). These gradients have also become less negative across successive cohorts, suggesting that education-specific fertility patterns are increasingly shaped by conditions that facilitate the reconciliation of employment and family life among the highly educated (Wood et al. 2014).

Assessing the aggregate fertility implications of WFH, therefore, requires not only examining the size and direction of education-specific associations but also depends on the distribution of exposure to remote-workable jobs and the age-parity schedule at which these associations occur. As shown by micro–macro approaches to fertility change, modest individual-level effects may have substantial population-level implications when they affect large or strategically positioned groups, such as women at ages relevant for fertility recuperation or transitions to higher-order births (Neels et al. 2024). Thus, even a relatively small positive association between WFH availability and birth risks among highly educated women may reshape aggregate educational gradients if exposure to WFH is concentrated in this group. Conversely, any fertility-enhancing potential of WFH among lower-educated women may remain limited if access to remote-workable employment is low, unstable, or weakly associated with autonomy and job security.

The expected aggregate implications are therefore ambiguous but likely stratified. WFH should contribute most to fertility among groups that are both highly exposed to remote-workable employment and able to convert this exposure into a meaningful work–family reconciliation resource. This points to stronger positive fertility effects among highly educated women, especially for second or higher-order births. For the first parity, however, WFH may also support career investment and thus reinforce postponement. Among lower-educated women, the fertility contribution of WFH availability is expected to be weaker or even negative, reflecting lower exposure to remote-workable jobs, shrinking labour market opportunities, and more precarious forms of remote employment. Overall, the expansion of WFH may therefore reshape the educational gradient in fertility by widening parity-progression differences between highly educated and lower-educated women.

3. The Belgian context

Belgium provides a useful setting for studying whether WFH availability is linked to educational differences in fertility. The country combines relatively high female labour-market participation (68% in 2023, Eurostat 2026b), extensive family-policy support, declining fertility (from TFR of 1.67 in 2001, through 1.86 in 2010, to 1.47 in 2023, Eurostat 2026c), and increasingly postponed childbearing (average age at first childbirth of 27.0 years in 2001 and 29.5 in 2023, Eurostat 2026d). It is also marked by a strongly upgraded educational composition among women: the share of women aged 25–64 with a higher-education diploma increased from 36% in 2011 to 42% in 2021, exceeding the corresponding share among men (30% in 2011 and 32% in 2021) (Statbel 2024).

Belgium is furthermore among the European countries where WFH became widespread relatively early. The share of employees working from home at least occasionally increased systematically over the last two decades and exceeded one-third by the mid-2020s (Statbel 2026). Yet access to WFH remains strongly stratified across occupations and sectors. Remote work is concentrated among managers, professionals, technicians, clerical workers, and public-sector employees (Statbel 2026), indicating that highly educated workers are substantially more likely to hold remote-workable jobs. By contrast, lower-educated workers remain overrepresented in occupations requiring physical presence, such as manufacturing, logistics, retail, and personal services.

Regional variation further strengthens the relevance of the Belgian case. Brussels, Flanders, and Wallonia differ in sectoral composition, employment opportunities, commuting patterns, demographic profiles, and childcare systems. OECD estimates show considerable territorial disparities in the share of jobs amenable to remote work, suggesting that regional WFH availability captures meaningful variation in local labour-market opportunity structures (OECD 2020). Earlier evidence also points to strong spatial inequalities in childcare availability and family-policy implementation. Despite comparatively high overall childcare coverage, municipalities differ substantially in access to formal childcare services, with higher coverage in urban and economically advantaged areas and lower provision in more rural and socioeconomically disadvantaged municipalities (Wood and Neels 2019).

4. Data and methods

4.1. Data and sample

The analysis combines two sources of data. First, we make use of longitudinal microdata drawn from the 2011 Belgian census and population registers for the period 2001-2019. The data provide population-wide individual-level information on women's age, level of education, municipality/district of residence, parity and age of their youngest child on the 1st of January in every observation year. These data allow us to construct woman-year records and identify transitions to first, second, third, and fourth or higher-order births.

Second, we use the Belgian Labour Force Survey to construct a time-varying regional indicator of WFH availability. For each year and NUTS2 region, we calculate the share of female workers who report working from home at least occasionally. This measure is interpreted as a contextual indicator of the regional availability of remote-workable jobs rather than as a measure of a woman's own WFH status. It is lagged by one year and linked to the register data by women's region of residence and calendar year.

4.2. Modelling strategy

We model fertility using the progressive multistate structure implemented in the ReNAISSANCE microsimulation model (Neels et al. 2024). Entry into parenthood and subsequent parity progression are modelled simultaneously, without imposing an upper limit on the highest parity considered. For reasons of efficiency, model estimation is largely compartmental: baseline hazard functions are parameterized separately for different parity transitions, although some covariate associations with birth hazards are constrained to be constant across parities. For fourth and higher-order births, baseline functions are estimated using incremental pooling.

We estimate discrete-time event-history models with a complementary log-log link. For first births, the baseline hazard is specified as a fourth-order polynomial of centered age, with women entering the risk set in the year in which they turn 15. The model allows the baseline to differ by educational level and period, distinguishing low (ISCED 0–2), medium (ISCED 3–4), and high level of education (ISCED 5–6) and time period of 2001–2005, 2006–2009, 2010–2014, and 2015–2019. Linear trends within these periods are also allowed. For second and higher-order births, hazards are modelled as a function of age at the index birth and duration since the index birth, differentiated by education and parity. Duration since the previous birth is specified using a regression-discontinuity structure, combining separate

estimates for the first four years after the index birth with a longer-duration term capturing the right-hand tail of the hazard. Interactions between duration and age at index birth are included to account for variation in spacing patterns.

The key explanatory variable is the one-year lagged regional WFH availability indicator. For first births, its association with birth hazards is allowed to vary by education and five-year age group, enabling us to assess whether WFH availability is linked to postponement at younger ages and recuperation at later ages. For second and higher-order births, the association with WFH availability is differentiated only by education, reflecting the more compact duration pattern of these transitions. The models also include time-varying controls for province, household position (LIPRO categories distinguishing living alone, married and cohabiting unions with and without children, children living with parents, one-parent households, non-family arrangements, other private households, and collective households), and household income (in deciles); these associations are constrained to be equal across birth orders.

4.3. Microsimulation

The hazard models estimate education-, age-, and parity-specific associations between regional WFH availability and birth risks. To assess whether these micro-level associations translate into aggregate fertility gradients, we use microsimulation following the logic of Neels et al. (2024). We compare two scenarios. In the first, women are exposed to the observed evolution of regional WFH availability. In the second, regional WFH availability is held constant at its 2001 level, while all other observed characteristics remain unchanged.

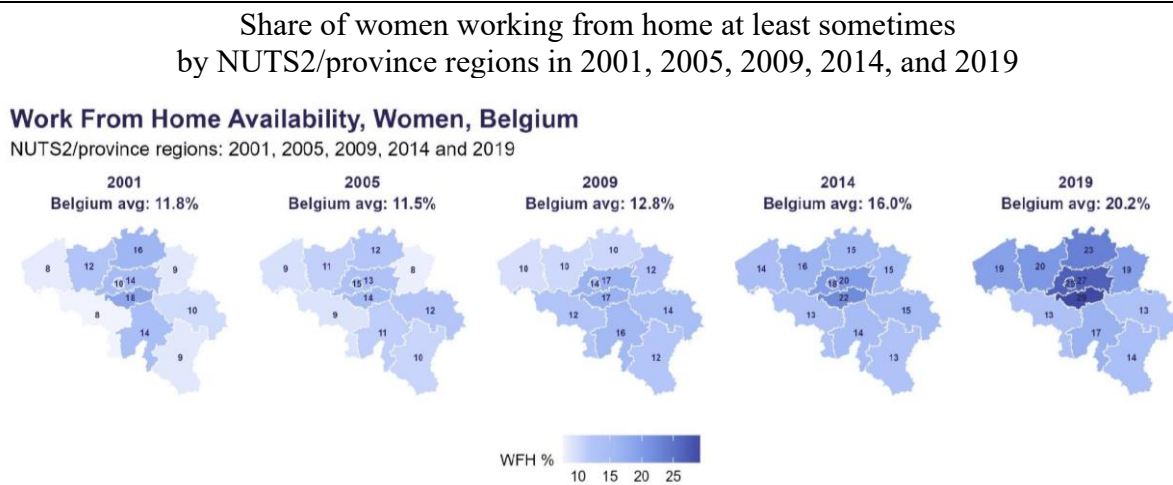
For each scenario, simulated births are used to calculate education-specific synthetic parity progression ratios. Comparing the observed-WFH and counterfactual-WFH scenarios indicates how much the increase in regional WFH availability over time contributed to parity progression in each educational group. This two-step approach allows us to assess not only whether regional WFH availability is associated with individual birth risks, but also whether these associations are large enough and sufficiently concentrated by education, age, and parity to reshape aggregate fertility gradients.

5. Results

5.1. Regional variation in WFH availability

Before turning to the birth-risk estimates, we first describe the regional variation in the WFH availability indicator used in the models. Figure 1 presents the share of women working from home at least occasionally across Belgian NUTS2 regions in 2001, 2005, 2009, 2014, and 2019. The maps show two main patterns. First, WFH availability increased over time. At the national level, the share of women working from home rose from about 12% in 2001 to 20% in 2019, with the increase becoming more visible after 2010. Second, this increase was spatially uneven. Regions with a stronger concentration of public administration, professional services, and knowledge-intensive employment – especially Brussels and the Brabant provinces – displayed consistently higher levels of WFH availability. By 2019, the share of women working from home reached about 25% in Brussels, 27% in Flemish Brabant, and 29% in Walloon Brabant.

Figure 1. Work from home availability [%], women, Belgium



Source: Labour Force Survey data for Belgium, 2001–2019.

In contrast, WFH availability remained lower in several regions where employment is more strongly tied to physical presence or where knowledge-intensive service employment is less concentrated, including Hainaut, Liège, Luxembourg, and Namur. Although most regions experienced some increase over the study period, the maps indicate that the expansion of WFH did not proceed uniformly across Belgium. Rather, it followed existing regional differences in occupational and sectoral structure. This descriptive pattern supports our interpretation of regional WFH availability as a labour-market opportunity structure: women

living in different parts of Belgium were exposed to different levels of remote-workable employment.

5.2. Regional WFH availability and birth risks

The first set of results examines whether regional WFH availability is associated with individual birth risks and whether this association varies by education, age, and parity.

For first births, the association between regional WFH availability and entry into motherhood varies strongly by education and age (Table 1, Panel A). Among low- and medium-educated women, higher WFH availability is generally associated with lower first-birth risks at younger and prime reproductive ages, while associations at later ages are mostly insignificant. The positive estimates at ages 45–49 should be interpreted cautiously, given the very small number of first births at these ages.

For highly educated women, the results are more clearly consistent with a postponement–recuperation pattern (Table 1, Panel A). Higher regional WFH availability is associated with lower first-birth risks between ages 20 and 34, but with higher first-birth risks from age 35 onwards. The positive estimate at ages 15–19 is difficult to interpret substantively, as very few women have completed tertiary education and enter motherhood at these ages. Overall, the results suggest that WFH availability is linked to delayed entry into motherhood among highly educated women, followed by higher birth risks later in the reproductive life course. This is consistent with the expectation that remote-workable employment may support career investment before motherhood, while later facilitating the realization of postponed first births.

The results for higher-order births differ from those for first births (Table 1, Panel B). For second births, regional WFH availability is positively associated with birth risks across all educational groups, although the associations are small in magnitude. For third births, the association is positive and statistically significant across all educational groups, but strongest among highly educated women. A similar pattern is observed for fourth and higher-order births: WFH availability is positively associated with birth risks for all educational groups, with somewhat stronger associations among medium- and highly educated women than among low-educated women.

Taken together, the hazard model estimates show that regional WFH availability is not uniformly associated with higher fertility. For first births, higher WFH availability is linked to postponement across all educational groups, with later recuperation observed only among highly educated women. For second and higher-order births, WFH availability is associated with higher birth risks across all educational groups, with the strongest associations among

the highly educated. These findings support our expectation that the fertility implications of WFH availability are educationally stratified and parity-specific. They also suggest that its aggregate contribution to the educational fertility gradient depends on whether higher birth risks at later ages and higher parities are sufficient to offset earlier first-birth postponement.

Table 1. Association between regional WFH availability and birth hazards by education, age, and parity

Hazard ratios with 95% confidence intervals			
Panel A. First births			
Transition / age group	Low (ISCED 0–2)	Medium (ISCED 3–4)	High (ISCED 5–6)
15–19	0.963*** [0.960, 0.966]	0.962*** [0.958, 0.966]	1.079*** [1.063, 1.095]
20–24	0.969*** [0.967, 0.972]	0.983*** [0.981, 0.985]	0.981*** [0.978, 0.983]
25–29	0.984*** [0.981, 0.986]	0.982*** [0.981, 0.984]	0.985*** [0.984, 0.987]
30–34	1.001 [0.998, 1.004]	0.991*** [0.990, 0.993]	0.991*** [0.989, 0.992]
35–39	0.986*** [0.981, 0.990]	0.998† [0.995, 1.000]	1.002* [1.001, 1.004]
40–44	0.988** [0.980, 0.997]	1.003 [0.998, 1.008]	1.012*** [1.009, 1.016]
45–49	1.082*** [1.060, 1.104]	1.012 [0.996, 1.027]	1.012* [1.003, 1.021]
Panel B. Higher-order births			
Transition	Low (ISCED 0–2)	Medium (ISCED 3–4)	High (ISCED 5–6)
Second birth (1 → 2)	1.007*** [1.004, 1.009]	1.005*** [1.003, 1.006]	1.007*** [1.006, 1.008]
Third birth (2 → 3)	1.013*** [1.009, 1.016]	1.023*** [1.021, 1.026]	1.029*** [1.027, 1.032]
Fourth or higher-order birth (3+ → 4+)	1.010*** [1.007, 1.014]	1.020*** [1.016, 1.023]	1.020*** [1.015, 1.025]

Notes: Entries are hazard ratios ($\exp(b)$) from a discrete-time complementary log-log model; 95% confidence intervals in brackets. Regional WFH availability is lagged by one year and measures the share of female workers in the NUTS2 region working from home at least occasionally. First-birth associations are differentiated by education and five-year age group; higher-order birth associations are differentiated by education. $HR > 1$ indicates higher birth risk; $HR < 1$ indicates lower birth risk. Significance: † $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

Source: Authors' calculations based on Belgian census and population register data, 2001–2019, linked to regional WFH availability from the Belgian Labour Force Survey.

5.3. Microsimulation results: Regional WFH availability and synthetic parity progression ratios

We next assess whether the associations estimated in the hazard models translate into aggregate fertility patterns. Figure 2 shows education-specific synthetic parity progression ratios under observed regional WFH availability (solid line) and under a counterfactual scenario in which WFH availability is fixed at its 2001 level (dashed line). The comparison between the two scenarios indicates whether the expansion of WFH contributed to changes in parity progression by education.

For the transition to motherhood, the educational gradient reversed over time (Figure 2, top-left). In the early 2000s, highly educated women had slightly lower progression to motherhood than women with low or medium education; from 2010 onwards, they had the highest progression, while low-educated women experienced the sharpest decline. The counterfactual results show that WFH expansion did not drive this reversal. Holding WFH availability at its 2001 level would have produced somewhat higher first-birth progression, especially among highly educated women in the 2010s. Thus, consistent with the hazard models, WFH expansion appears to have contributed to depressed first births rather than to higher entry into motherhood.

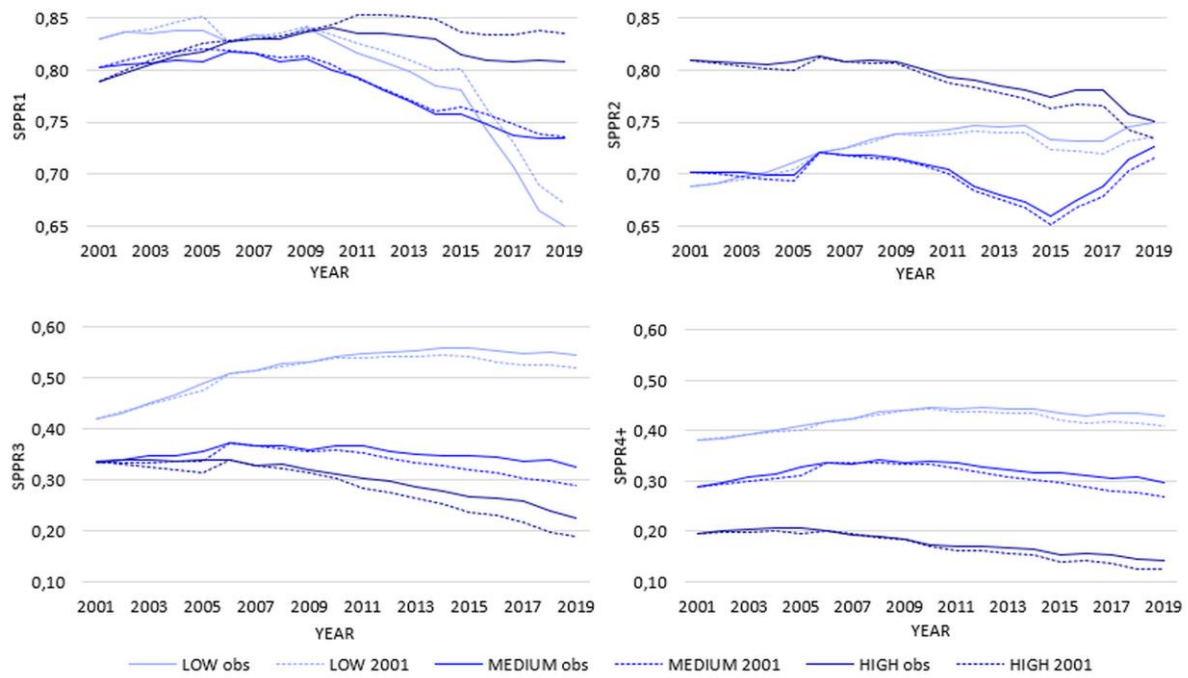
The pattern differs for second births (Figure 2, top-right). Progression to a second child converged across educational groups: the initially higher progression among highly educated women declined, while progression among low-educated women increased. In contrast to first births, the counterfactual lines lie slightly below the observed-WFH scenario, suggesting that the expansion of WFH availability modestly supported progression to a second child.

For third births, the educational gradient became increasingly negative (Figure 2, bottom-left): progression rose strongly among low-educated women but declined among highly educated women. WFH expansion raised third-birth progression across educational groups, especially among medium- and highly educated women, but did not offset the growing divergence.

For fourth and higher-order births, the educational gradient was already strongly negative and remained so throughout the period (Figure 2, bottom-right). Low-educated women had the highest progression, followed by medium- and highly educated women. As with third births, the expansion of WFH appears to have supported higher-order parity progression across educational groups.

Overall, WFH expansion had parity-specific aggregate implications: it was associated with lower progression to motherhood, especially among highly educated women, but with higher progression to second and higher-order births. Its contribution was visible but modest, modifying rather than driving changes in the educational gradient in fertility.

Figure 2. Synthetic parity progression ratios by education under observed and counterfactual regional WFH availability



Notes: Solid lines show synthetic parity progression ratios under the observed yearly level of regional WFH availability. Dashed lines show the counterfactual scenario in which regional WFH availability is held constant at its 2001 level. SPPR1, SPPR2, SPPR3, and SPPR4+ refer to synthetic parity progression ratios to first, second, third, and fourth or subsequent births, respectively. Education is grouped into low, medium, and high levels.

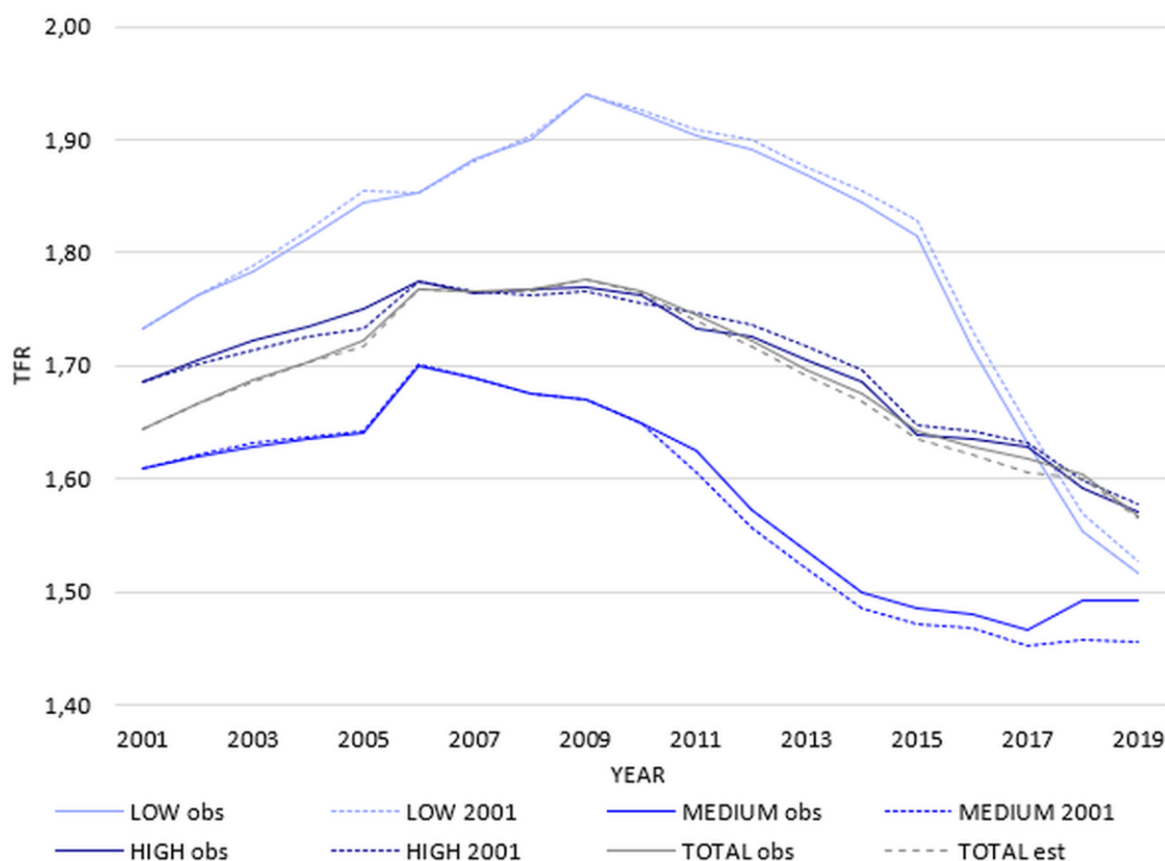
Source: Authors' calculations based on Belgian census and population register data, 2001–2019, linked to regional WFH availability from the Belgian Labour Force Survey.

5.4. Aggregate fertility gradient by education

Finally, Figure 3 shows how these parity-specific patterns translate into aggregate fertility rates by education (calculated directly from PPRs). In the observed-WFH scenario, fertility rose during the 2000s and declined after the Great Recession, especially from the early 2010s and most clearly among low-educated women. For most of the period, the educational gradient in total fertility was U-shaped: fertility was lowest among medium-educated women, highest among low-educated women, and close to the population average among highly educated women. In the final years, however, highly educated women's fertility exceeded that of low-educated women, reflecting the reversal in first-birth progression shown previously on Figure 2.

The counterfactual scenario indicates that WFH expansion made only a modest contribution to total fertility. For low- and highly educated women, observed and counterfactual trends are very similar, with slightly higher counterfactual fertility in some later years. For medium-educated women, observed fertility after 2010 is slightly higher than in the counterfactual scenario, suggesting a small positive contribution of WFH expansion. For the total population, the contribution is also very small and, if anything, slightly positive. Overall, Figure 3 confirms that WFH expansion did not drive the post-2010 fertility decline or substantially reshape the educational gradient in total fertility. Its contribution is more visible in parity-specific progression ratios than in fertility level, where opposing associations across parities partly offset one another.

Figure 3. Synthetic total fertility rate by education under observed and counterfactual regional WFH availability



Notes: Solid lines show synthetic total fertility rates under the observed yearly level of regional WFH availability. Dashed lines show the counterfactual scenario in which regional WFH availability is held constant at its 2001 level. Education is grouped into low, medium, and high levels. The total line refers to the full female population included in the simulation.

Source: Authors' calculations based on Belgian census and population register data, 2001–2019, linked to regional WFH availability from the Belgian Labour Force Survey.

6. Discussion

This study examined whether the expansion of working from home is associated with changes in fertility behaviour and in the educational gradient in fertility. Rather than focusing on women's individual WFH use, we conceptualized regional WFH availability as a contextual feature of local labour markets: an indicator of whether women live in areas where remote-workable employment is more or less accessible. Building on theories of work–family reconciliation, labour-market stratification, and educational differences in family formation, we expected that WFH availability would reshape the conditions for childbearing differently by education, age, and parity.

The results support this expectation by showing that the association between regional WFH availability and fertility is strongly parity-specific. For first births, higher WFH availability was linked to lower birth risks at younger ages across educational groups. Among highly educated women, positive associations appeared at later ages, but the microsimulation results suggest that this recuperation did not fully compensate for earlier postponement. At the aggregate level, the expansion of WFH was therefore associated with lower progression to motherhood rather than facilitated entry into parenthood. Before the first birth, high-WFH labour markets may support continued career investment more than they reduce the perceived costs of childbearing.

This interpretation is consistent with demographic research showing that first births are sensitive to educational enrolment, career establishment, and uncertainty about future work–family compatibility. Women often delay motherhood because the opportunity costs of early childbearing are high and because the sequencing of education, employment, partnership, and parenthood has become increasingly prolonged (Van Bavel 2010; Wood et al. 2014; Greulich and Toulemon 2023). Our results suggest that WFH expansion does not necessarily weaken this logic. In regions where remote-workable jobs are concentrated in professional and knowledge-intensive sectors, WFH availability may reinforce postponement by making continued career consolidation more feasible before motherhood.

The pattern differs after the transition to parenthood. For second and higher-order births, regional WFH availability was generally associated with higher parity progression. This supports our theoretical claim that WFH becomes more valuable once women already have children and face concrete reconciliation demands. For mothers, reduced commuting, spatial flexibility, and greater control over the timing of work may lower the marginal cost of another child. This finding is consistent with previous evidence suggesting that home-based work

and broader work flexibility are more favourable for higher-order fertility than for entry into motherhood (Sinyavskaya and Billingsley 2015; Osiewalska et al. 2024; Osiewalska and Matysiak 2025).

A central contribution of the paper is to show that micro-level associations do not translate directly into macro-level fertility change. The hazard models revealed clear age-, parity-, and education-specific associations between regional WFH availability and birth risks. Yet the microsimulation results indicate that the contribution of WFH expansion to aggregate fertility rates was modest, because negative associations with first births and positive associations with higher-order births partly offset one another. Thus, the aggregate consequences of WFH depend not only on the direction of its association with birth risks, but also on where these associations occur in the age-parity schedule and which educational groups are most exposed (Neels et al. 2024).

These findings refine the expectation that WFH may reshape educational fertility gradients. They support the view that the fertility implications of WFH are stratified and life-course specific, but not the simpler interpretation that the digital shift substantially raises fertility among highly educated women and transforms the overall educational gradient. Among highly educated women, WFH availability is associated with postponement of first births, some recuperation at later ages, and higher progression to subsequent births. Among lower-educated women, the benefits are weaker, and for first births the association is also negative. High regional WFH availability therefore does not necessarily represent an inclusive reconciliation resource, especially if remote-workable employment expands mainly in high-skilled sectors.

The findings also contribute to theories of work–family reconciliation and low fertility. Research has long argued that fertility is higher where women’s employment and family life are more compatible, whether through childcare, parental leave, gender-egalitarian arrangements, or supportive labour-market institutions (McDonald 2000; Matysiak and Vignoli 2008; Rindfuss et al. 2007; Goldscheider et al. 2015; Matysiak and Vignoli 2026). Our results support this argument, but also show that WFH is an ambivalent reconciliation resource. Unlike childcare or leave entitlements, WFH is attached to occupations, sectors, education, employers, and regions. Its fertility implications are therefore more unequal and ambiguous than those of broadly accessible family policies.

The policy implications are therefore cautious. WFH should not be treated as a simple solution to low fertility. Expanding remote work may help some parents reconcile employment and care, particularly after the first child, but it is unlikely to compensate for inequalities in job

quality, income security, childcare availability, housing affordability, or gendered divisions of unpaid work (Guetto et al. 2025). In Belgium, WFH may complement existing reconciliation policies, but it cannot substitute for secure employment and broadly accessible childcare. If remote work expands mainly in high-skilled occupations, it may even reinforce inequalities in access to work–family reconciliation.

Several limitations should be acknowledged. First, our measure captures regional WFH availability rather than individual WFH access or use. This is appropriate for our focus on local labour-market opportunity structures, but it means that we cannot observe whether a specific woman personally worked from home. Second, regional WFH availability may capture other local labour-market changes, including occupational upgrading, commuting patterns, and broader economic conditions. Although the models control for province, household position, household income, and other time-varying characteristics, the estimates should be interpreted as associations rather than causal effects. Third, we focus on women’s fertility and do not fully capture partners’ employment conditions (compare Osiewalska and Matysiak 2026). Finally, the study covers the pre-pandemic expansion of WFH; the normalization of remote and hybrid work after 2020 may have changed both access to WFH and its social meaning.

Overall, this study shows that the digital shift in work organization matters for fertility, but not in a uniformly fertility-enhancing way. Regional WFH availability is associated with lower progression to first births and higher progression to subsequent births, with associations varying by education and age. Yet its contribution to total fertility and to the overall educational gradient is modest, because parity-specific associations partly offset one another. WFH should therefore be understood less as a direct solution to low fertility and more as a stratified labour-market change that modifies the conditions under which different educational groups form and enlarge families.

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