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Gender Dynamics in Czechia Household Fertility: Logistic Regression Insight

Authors: Tereza Frömmelová[1], Filip Hon[2], Jitka Langhamrová[3]

Corresponding author: Tereza Frömmelová <tereza.frommelova@vse.cz>

Abstract

This study investigates the social and economic factors that shape and affect the fertility level in the Czech Republic. The study explores the sociocultural and economic dimensions that influence fertility decisions by employing a multidisciplinary approach to survey data from the Czech Household Panel Survey. Logistic regression was applied to solve this problem. The approach allows us to define how chosen socio-cultural and economic variables change the odds of having children. The fertility of the sample is defined through the variable that establishes the presence of children of a certain age living in a household. It should be noted that the household-based measure of fertility used in this study does not directly capture biological parenthood, which may result in either an overestimation or underestimation of individual fertility behaviour. The effect of the socio-economic environment was examined for both genders separately. While the importance of marital status is no longer as influential in child-bearing decisions as it used to be, respondents are significantly more likely to live in households with children if they are married. Municipality size, in the case of the Czech Republic, has no significant effect on either gender. On the other hand, economic status and the type of work contract have a crucial impact on the odds of living in households with children. This has been explicitly noted in the case of the population of women, which illustrates the persistence of a strong gender division of parental roles in society. The results highlight substantial gender asymmetries. Men's fertility patterns are closely tied to stable full-time employment, and married men are significantly more likely to live in households with children than never-married men. In contrast, women's fertility is more strongly associated with part-time work or homemaker roles.

Keywords: Total Fertility Rate, Logistic Regression, Reproduction Behavior Factors, Household Fertility.
JEL Classification: J13, Z13.

[1] Department of Demography, Faculty of Informatics and Statistics, Prague University of Economics and Business, W. Churchill sq. 1938/4, Prague 3, 130 67, Czech Republic. ORCID iD: https://orcid.org/0009-0009-2008-8605, Email: tereza.frommelova@vse.cz
[2] Department of Demography, Faculty of Informatics and Statistics, Prague University of Economics and Business, W. Churchill sq. 1938/4, Prague 3, 130 67, Czech Republic. ORCID iD: https://orcid.org/0000-0003-1433-9817, Email: filip.hon@vse.cz
[3] Department of Demography, Faculty of Informatics and Statistics, Prague University of Economics and Business, W. Churchill sq. 1938/4, Prague 3, 130 67, Czech Republic. ORCID iD: https://orcid.org/0000-0002-8127-6433, Email: jitka.langhamrova@vse.cz

Introduction

The Czech Republic, like many other post-socialist nations, experienced a significant decline in fertility rates toward the end of the 20th century. However, in the late 2000s, the country witnessed a distinct reversal of this trend. In recent years, the total fertility rate has been among the highest in the European Union. This trend was again reversed as the weakest generations of the 1990s came to their child-bearing years.

This article aims to investigate the multifaceted nature of factors influencing reproduction decisions in the Czech Republic. It seeks to provide an in-depth analysis of the social, economic, and cultural dynamics that underpin the resilience of fertility rates in the country. The article also aims to find gender differences in these factors. The findings of this study will enhance the understanding of fertility trends in the Czech Republic and help policymakers develop evidence-based strategies.

This article integrates a multidisciplinary approach to understand and explain the factors influencing fertility in the Czech Republic. Drawing on the Czech Household Panel Survey, we examine vital determinants that shape fertility decisions among the respondents. The analysis focuses on the demographics of the respondents, and the available data allow for a unique view of fertility from a household perspective, thus allowing for the inclusion of gender differences in factors influencing reproductive behavior.

Sociocultural factors, gender roles, family values, and attitudes toward childbearing all influence reproductive behavior. Furthermore, the interaction between educational attainment, participation in the labor force, and child-rearing responsibilities is vital to understanding how individuals reconcile work and family life.

The economic landscape also provides helpful information on the fertility patterns observed in the Czech Republic. Economic factors such as income stability, housing affordability, and family-friendly employment opportunities, such as part-time employment, can significantly impact fertility intentions and family planning. Understanding the interdependence between economic conditions and fertility outcomes can help to understand the mechanisms that sustain relatively high fertility rates by European standards.

Of course, only those variables that allow statistically responsible comparisons based on the data source will be included in the analysis. Fortunately, the selected survey provides suitable support for a sufficiently detailed analysis.

The first theoretical parts of the article focus on the main findings known from the literature on reproductive behavior in the Czech Republic. Some of these findings are not currently available in English, and we consider a summary of the main conclusions appropriate given the potential language barrier for the reader of this paper. The theoretical part also provides a brief theoretical insight from G. Becker's work on Family Planning, which leads to the identification of key factors for our analyses. In the following section, we also detail our process for selecting variables from the statistical point of view and address the issue of multicollinearity, ensuring a transparent approach to our analysis.

The following methodology section elucidates the steps taken in our logistic regression analysis, providing a detailed account of our findings. The results of our study, which compare gender disparities and highlight

the impact of specific variables, are presented. Of course, in the analytical part of the paper, we also treat regression analysis responsibly and as a helpful tool that provides additional information without overestimating its results. That is why we have taken several statistically appropriate measures here as well. We subject the most interesting findings from the regression analysis to a bivariate visualization analysis via percentage-stacked bar charts, commonly used in similar circumstances.

Finally, we determine the key takeaways from our exploration, emphasizing the importance of these findings in understanding fertility trends and diversity in the Czech Republic.

Literature Review

Fertility in the Czech Republic

For 1950, a high level of fertility was typical in all observed aspects, mainly due to the recovery of fertility after World War II and the promise of social security at the beginning of the socialist regime. Although these factors did not have such a strong impact in the following years, and the overall fertility rate declined, fertility remained relatively high until the end of socialism in the late 1980s due to the society's values and attitudes. After the Velvet Revolution in 1989, the Czech Republic began a change in social values associated with the overall transformation of the economy and political scene. Opportunities for education, travel, and new career and life opportunities increased, and significant changes occurred in society (Sobotka 2011; Sobotka et al. 2008). Society values began to change, reflected in the growing trend of delaying the birth of the first child until the woman's 30s (Billingsley 2010; Kohler, Billari and Ortega 2002). On the other hand, the transformation of the economy led to increased economic uncertainty, such as the threat of unemployment, which was more pronounced than at the end of the socialist regime (Rychtaříková 1996). There have been several debates in the Czech demographic environment about whether economic uncertainty or the change in social values was more responsible for the so-called „lowest-low fertility" at the turn of the millennium. These debates eventually crystallized into accepting several common theses considering cultural and economic factors (Rabušic 2001).

The transformation of family behavior within society is inherently an interdisciplinary matter with implications extending into sociology and other fields (Crimmins 1991; Johnson-Hanks et al. 2011). Nevertheless, some experts collectively refer to these shifts in demographic behavior as the „second demographic transition". In certain Western European countries, this transition began several decades earlier (Van de Kaa 2003). Within post-socialist states, this transition often occurred rapidly and gained momentum, particularly after the dissolution of the Soviet Union (Van de Kaa 2002). Subsequently, there was a noticeable improvement in fertility rates, facilitated not only by economic improvement but also by the recovery of postponed childbirths at later ages. Nonetheless, reproductive behavior did not revert to its original state (Fiala et al. 2018; Bongaarts and Sobotka 2012).

The second demographic transition naturally exhibits its specificities in each country; in the case of the Czech Republic, for example, even compared to other postsocialist nations, lifelong childlessness has been notably low until recently (Kreyenfeld and Konietzka 2017). Similarly, as observed in other states, the dominant family model has been the two-child family, with women having three or more children being relatively rare within the population, especially when compared to some other postsocialist countries, for example in Slovakia (Šprocha et al. 2016). The decline in overall fertility is primarily influenced by the

increasing proportion of women with only one child and those remaining childless throughout their lives (Hašková, Dudová and Pospíšilová 2019).

Factors affecting fertility in the Czech Republic

Numerous factors undoubtedly contribute to the growing number of lifelong single-child households. Equally significant are the factors related to marital trends within the population, such as the rise in lifelong single women and increasing divorce rates (Fiala et al. 2018), as well as the ongoing substantial growth of the highly educated segment of the population (Hon, Kadlecová and Langhamrová 2021). Considerable disparities are observed across the population based on education, marital status, and even religious beliefs in total fertility rates, including higher birth orders (Hon 2020).

Based on a wide range of survey data, additional factors influencing the decision to have a child can be identified. Notably, the absence of a stable partner, health status, the number of siblings to grow up with, diminishing emphasis on parenthood as an essential life component, approaching the age of forty, and the consequent reevaluation of reproductive plans with advancing age in general, are significant factors (Hašková and Pospíšilová 2020). Similar factors emerge from studies conducted on the male population, although men tend to engage in reproduction on average at a later age. Particularly pivotal for the male demographic in reproductive planning are economic status and the availability of independent housing (Kyzlinková and Šťastná 2016). For instance, men with lower education often adhere to the traditional family model and the male breadwinner role; however, they struggle to fulfill this role due to their low economic status. Conversely, those with higher education tend to challenge traditional partnership behavior (Šťastná and Paloncyová 2011). Similar factors to those in the Czech Republic have become central in neighboring countries and across the European Union in recent decades, as evidenced, for instance, by Eurobarometer surveys (Testa 2007).

Improving reproductive conditions, whether through a gradual natural shift in circumstances or via effective pro-population measures, is imperative. For instance, a significant finding arising from the primary outcome of the research on families conducted by the Research Institute for Labour and Social Affairs suggests that reproductive intentions often remain unrealized considering actual circumstances (Kuchařová et al. 2020). When broadening the perspective to encompass the European Union as a whole, as indicated by Eurobarometer surveys, it becomes evident that these realities extend across the rest of the EU. Approximately thirty percent of individuals, both men and women, over the age of forty have fewer children than they desire (Testa 2012).

Family planning according to Gary Becker

The topic of influences of family planning and fertility behavior is one of the key themes of the work of Nobel Prize-winning economist Gary Becker. Gary Becker argued that various economic and social factors influence human fertility behavior. According to his economic model of fertility, the decision to have children is based on a cost-benefit analysis, where the benefits of having children are weighed against the costs of raising them. Becker identified several key factors that affect fertility behavior, including the cost of raising children, the opportunity cost of foregone income from having children, the price of childbearing, and the value of time spent on childbearing. He also noted that social norms, cultural attitudes, and government policies could influence fertility behavior (Becker 1960).

Family economics employs various mathematical and economic models to describe and analyze the behavior and decision-making of individual family members. In microeconomics, a standard extension of Becker's theory involves utilizing the family utility function to maximize it. Children and all other forms of consumption are incorporated into the utility function of parents (Joseph Hotz, Klerman and Willis 1997). In the context of decisions concerning consumption in the form of the number of children, parents have particular demands not only in terms of quantity, i.e., the number of children but also in terms of their quality, which they contemplate as future investments in children, such as education (Becker and Lewis 1973).

The following equation can represent the utility function:

$$U = U(n,q,y), \quad (1)$$

Where n represents the number of children, q denotes the quality of children, and y represents the consumption of all other commodities.

Conversely, Becker's model (Becker 1960) defining reproductive behavior is grounded in a cost-benefit analysis. This establishes the decision to have a child as a search for equilibrium between the benefits derived from parenthood and the associated costs. Becker identified several key factors that exert a decisive influence on family planning. Among these are the costs associated with child-rearing, the probable delay in income, and the value of time spent on child-rearing. He also recognized that establishing a family is significantly influenced by societal norms, cultural practices, and even political measures targeted at reproductive behavior.

Subject to Becker's earlier inquiry are also the income and substitution effects. Therefore, if we exclude the parameter representing the quality of children from the utility function, we arrive at the equation in the following general form:

$$U = U(n,Z), \quad (2)$$

Where Z denotes the consumption of other commodities and n represents the number of children, for which, according to Becker and Lewis (1973), perfect substitutes do not exist.

According to Becker (1981), the roles of individual family members, particularly spouses/partners, are primarily founded on their specialization and comparative advantage relative to other household members. Becker's theory underscores the concept of division of labor within the household.

Individual household members possess varying abilities, skills, and preferences that determine their production capacities and, thus, their role in economic decision-making. Becker (1981) underscores the significance of focus and division of labor within the household. He recommends that individuals concentrate on activities in which they hold a comparative advantage over other household members. Moreover, they should base their decisions on their skills, education, and prior experiences.

The defined specialization of family members enables the family unit to allocate time and resources while maximizing household productivity efficiently. An example of efficient resource allocation could be where one partner focuses on paid work outside the home while the other concentrates on childcare and household tasks. Becker contends that even in this case, the inclination towards specialization is driven by disparities in the market potential of partners, labor market opportunities, and personal preferences (Becker 1981).

From Becker's perspective, economic decisions are the outcomes of a process of bargaining and negotiation, where each family member strives to maximize their wellbeing while considering the satisfaction of others. His theory aimed to apply economic principles to family behavior. He viewed family decisions, such as marriage, childbearing, and division of labor, as the outcome of rational choices made by individuals seeking to maximize utility. However, critics of this theory argue that his approach oversimplifies family life and overlooks emotional, moral, and cultural dimensions that cannot be easily quantified.

As an example, Cherlin (2004) criticizes the reductionist nature of Becker's theory by highlighting how modern family structures no longer follow the predictable patterns that Becker's model assumes. Cherlin points out that the traditional roles of breadwinner and homemaker have weakened, especially as more women enter the workforce. Cohabitation has become a common alternative to marriage, and same-sex marriages challenge the gendered assumptions on which economic specialization models rely. Cherlin emphasizes that contemporary marriages are less about role fulfillment and more about self-development and emotional satisfaction, which are difficult to capture through economic calculations.

Similarly, Nancy Folbre (Oliver 2004; Folbre 2001), challenges the dominance of market-based thinking in the analysis of family and care work. Folbre criticizes theories such as Becker's for ignoring non-market activities such as caregiving, which are often unpaid and disproportionately carried out by women. She argues that caregiving is essential to human development and should be seen not as a private choice but as a societal responsibility. Unlike Becker, who sees economic exchange at the center of family life, Folbre calls for a „moral economy" rooted in obligation, reciprocity, and community support. She highlights how the undervaluation of care has led to its being treated as a luxury for those who can afford it, thus reinforcing social inequalities.

Both mentioned authors (Folbre 2001; Cherlin 2004) agree that Becker's framework is insufficient for capturing the complexities of modern family life. They point out that decisions around marriage and caregiving are shaped not just by utility maximization, but also by shifting cultural norms, symbolic values, and moral considerations. As the meaning of marriage changes and the role of care becomes increasingly recognized, it becomes clear that a purely economic approach cannot fully explain how families function or evolve.

Variable Selection

The quantitative analysis performed in this paper aims to understand the dynamic relationship between fertility behavior and external factors. This chapter will summarize the expected effects that have been researched before. This section focuses only on the socio-economic background that we used to select the variables for the analysis. However, when choosing them, it is necessary to consider the potential of the data source and the applicability of statistical methods according to their assumptions on a particular dataset. This will be discussed in the following chapter.

The relationship between the age of a woman and her potential to have a child is, from the biological perspective, evident. On the other hand, the effect of the age of men may differ. Men consider several internal and external factors before having a child. These include, for example, financial security, personal beliefs, and values regarding parenthood as well as their partner's view on having children (Roberts et al. 2011). The aspect of financial security is represented in the model by information about economic status.

The relationship between fertility and marital status has significantly changed with the change of the modern society. Researchers tend to agree that the overall decline in fertility is due to the significant changes in the timing of childbearing, with women delaying childbearing until later in life. Authors suggest that the most significant disproportions between childbearing and marital status are seen amongst college-educated women, where an increasing trend of having non-marital first children has been noted (Cherlin 2021).

Historically, there has always been a difference between childbearing tendencies in rural and urban locations. With that in mind, we tried to include the municipality size to represent this aspect of living conditions. Studies found that urbanization and fertility are related in European countries, as urbanites tend to have lower fertility rates than rural dwellers. The authors highlight that the impact of urbanization on fertility varies across different population groups within Europe, with some groups being more affected by urbanization than others. Although some studies found a significant association between population size and birth rate, they concluded that population size explained only a small fraction of the birth rate variability between municipalities (Oura 2021).

Vignoli et al. (2020) discusses how economic uncertainty affects fertility behavior. The study highlights that phenomena such as unemployment and economic instability negatively impact European fertility rates. Economic factors, represented by economic activity in this research, play a significant role in shaping childbearing patterns. It is crucial to understand that the impact of economic uncertainty on fertility varies across different population groups. Among the oldest generation, the belief that men should be the main providers for the household remains dominant. Among younger people, however, more egalitarian views on gender roles in the family are increasingly common (Procházková 2006). Although men are increasingly involved in domestic duties and parenting, research shows that women continue to carry the majority of routine household work, often referred to as the „second shift". As the male role remains focused on public and economic spheres, women tend to assume greater responsibility for the household and childcare, which may make part-time or stay-at-home arrangements more compatible with expectations placed on them within the family (Bierzová 2006).

The highest level of completed education has been identified as a significant factor influencing childbearing behavior, particularly with the increasing representation of tertiary education, especially among women. Studies have found that women with higher educational attainment and higher potential wages encounter higher opportunity costs for childbearing, leading to differences in fertility rates by education level. As seen in other groups of variables, the effect of education level on fertility varies across different population groups (Brand and Davis 2011).

The data for this analysis were drawn from the Czech Household Panel Survey (CHPS) from the 5th wave conducted in 2019. The total sample was 4,403 respondents, of which 47.51 % were men and 52.49 % were women. For the selected variables, 3,265 observations can be included in the regression model.

In the evaluation of dichotomized multinomial variables, one less dummy variable has to be included than there are categories – for this purpose, the excluded variables were parental status widowed, number of inhabitants 100,000 and more, full-time economic position and education 4-year professional secondary, with graduation exam based on the combinatorial calculation performed by the software SPSS. The resulting output shows that the included variables in the model are not significantly contaminated by multicollinearity; none approach the critical VIF value of 10. The highest values are attributed to age and

economic position variables, but they are at most half of the said level. We have tried other dummy combinations of variables as well. Therefore, there is no reason to omit these potentially critical multinomial variables.

During exploratory data analysis, we did not find it necessary to transform any of the mentioned variables, they entered the model in their original scales. Stepwise and iteration options were left at the default recommended values of the computational software SPSS and Jamovi. As a means of verifying the suitability of the variables and dataset, we employed tests and tools, which demonstrated that the variables included in the model are not significantly affected by multicollinearity, as none of the VIF values approached the critical threshold of 10 (considering the size of the sample).

Results

For the first exploration of the results of the logistic regression, it seems helpful to glance at the likelihood ratio tests for each variable. The p-value of the tests is visualized in the following table, where the p-value is over 0.9, it is shown as „—“. The p-value over 0.5 is signed as „–”, the p-value over 0.1 is signed as „-“, the p-value over 0.01 is signed as „*”, and finally the remaining is shown as „**”.

Table 1: Likelihood Ratio Tests.

Dependent Variable	**Data Base**	**Age**
Household with children under 5 years old	Male 25–44 years old	–
	Female 25–44 years old	—
Household with children under 11 years old	Male 25–44 years old	**
	Female 25–44 years old	**
Dependent Variable	**Data Base**	**Municipality Size**
Household with children under 5 years old	Male 25–44 years old	—
	Female 25–44 years old	—
Household with children under 11 years old	Male 25–44 years old	–
	Female 25–44 years old	–
Dependent Variable	**Data Base**	**Education Level**
Household with children under 5 years old	Male 25–44 years old	**
	Female 25–44 years old	——
Household with children under 11 years old	Male 25–44 years old	—
	Female 25–44 years old	**
Dependent Variable	**Data Base**	**Marital Status**
Household with children under 5 years old	Male 25–44 years old	**
	Female 25–44 years old	**
Household with children under 11 years old	Male 25–44 years old	**
	Female 25–44 years old	**
Dependent Variable	**Data Base**	**Economic Status**
Household with children under 5 years old	Male 25–44 years old	*
	Female 25–44 years old	**
Household with children under 11 years old	Male 25–44 years old	*
	Female 25–44 years old	**

In terms of hypothesis tests, we can see differentiation of results mainly by the marital and economic status of the respondent. On the other hand, no large differences are expected by municipality size, where the p-value comes out statistically insignificant.

In the case of age, it is interesting to note that models with dependent 0-5 do not consider age as an important variable, which is probably due to the relatively low threshold of five years in the exploratory data, where older parents often already have a child of six years or older at home (reverting to a ”childless household” in terms of the model), and thus the hypothesis test does not identify an effect of age for the model. The interpretation is then difficult for the education variable.

Of course, one should always be cautious with hypothesis tests on parameters, even when controlling multicollinearity, and given their potential failure in various cases, not to rely on them unquestionably (Wasserstein, Schirm and Lazar 2019), but in our opinion, they do provide interesting additional information. After exploring these elementary model results, we can proceed to the main section devoted to the interpretation of the estimated parameters.

It is worth mentioning that due to decent multicollinearity with the given sample size, we do not consider it necessary to omit any of the variables that appear insignificant through the hypothesis test in the logistic regression model. This would not increase the validity of the model or improve the interpretability of the models. For the proportions of social science research, models according to pseudo-R statistics explain a relatively large part of the variability of the dependent variable.

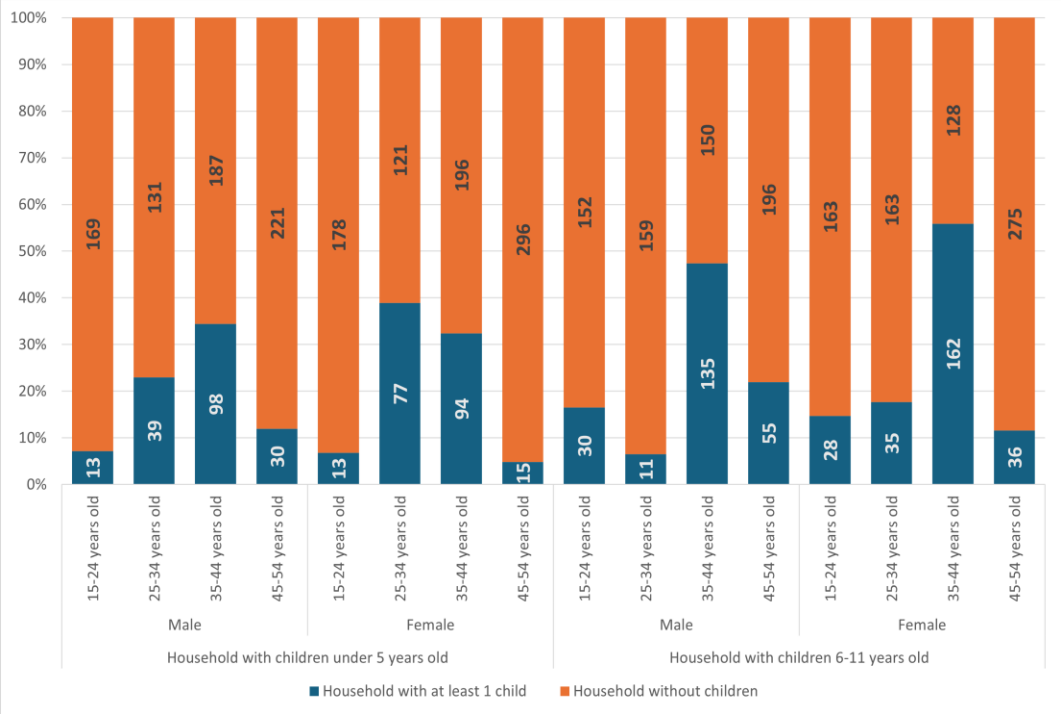
The presence of children in the household under 5 (referred to as „youngest children”) and the presence of children between 6 and 11 years of age in the household (referred to as older children) were chosen as dependent variables. The reference category for both dependent variables is the value „without children”. For every variable category, an odds ratio was computed, which can be found tables below. The principles of the interpretation of the results used in this paper follow the methods explained in the literature (Lawal and Lawal 2003; Agresti 2002). We examined the paired relationships between independent and dependent variables using logistic regression. This method was chosen due to its intuitive interpretation.

The ranges and categories were defined to determine the computability of the statistical method. Both dependent variables are binary, meaning that they represent whether children are living in said household. Several models were specified: one for the whole population entering the survey and, due to its more complex interpretation and the research requirement to identify gender differences, also for the different genders of the 15 to 54-year-old population.

Variable 1: Age category

Binary logistic regression was conducted on the data with the aim of examining the paired relationships of the independent and dependent variables, as specified above. As seen in the following graph, there are differences between men and women in terms of age, in that they tend to live in households with children. Generally, the typical age for men likely to live in a household with children is higher than for women. This is valid for both age categories of children.

Figure 1: Respondents Living in Households with Children According to Age and Gender (*Number of Respondents*).



The odds ratio of living in households with children was computed for men and women for younger (under 5 years of age) and older (6 to 11 years of age) children.

The odds of living in a household with children of a certain age are displayed in the table below. The green number signals higher odds than the reference category, and the red value signals lower odds than the reference category. This structure and formatting rule will be used throughout the entire paper.

The highest odds of living in a household with children under 5 years of age are 35 to 44 years for men. Men aged 35-44 have almost seven times higher odds of living in a household with little children than the reference category.

The female respondents' peak is aged 25 to 34 years. Women of this age have 8.7 times higher odds of living in a household of living in a household with little children than the youngest respondents.

Table 2: Odds of Living in a Household with Children According to Age and Gender (*With Respondents Aged 15 to 24 Years as the Reference Category*).

	Odds of living in households with children under 5 years old compared to 15-24 years olds		**Odds of living in households with children between 6 and 11 years old compared to 15-24 years olds**	
Age Category	**Male**	**Female**	**Male**	**Female**
25–34 – 15–24 years old	**3.87**	**8.71**	**2.85**	**1.25**
35–44 – 15–24 years old	**6.81**	**6.57**	**4.56**	**7.37**
45–54 – 15–24 years old	**1.76**	**1.44**	**1.42**	**1.31**

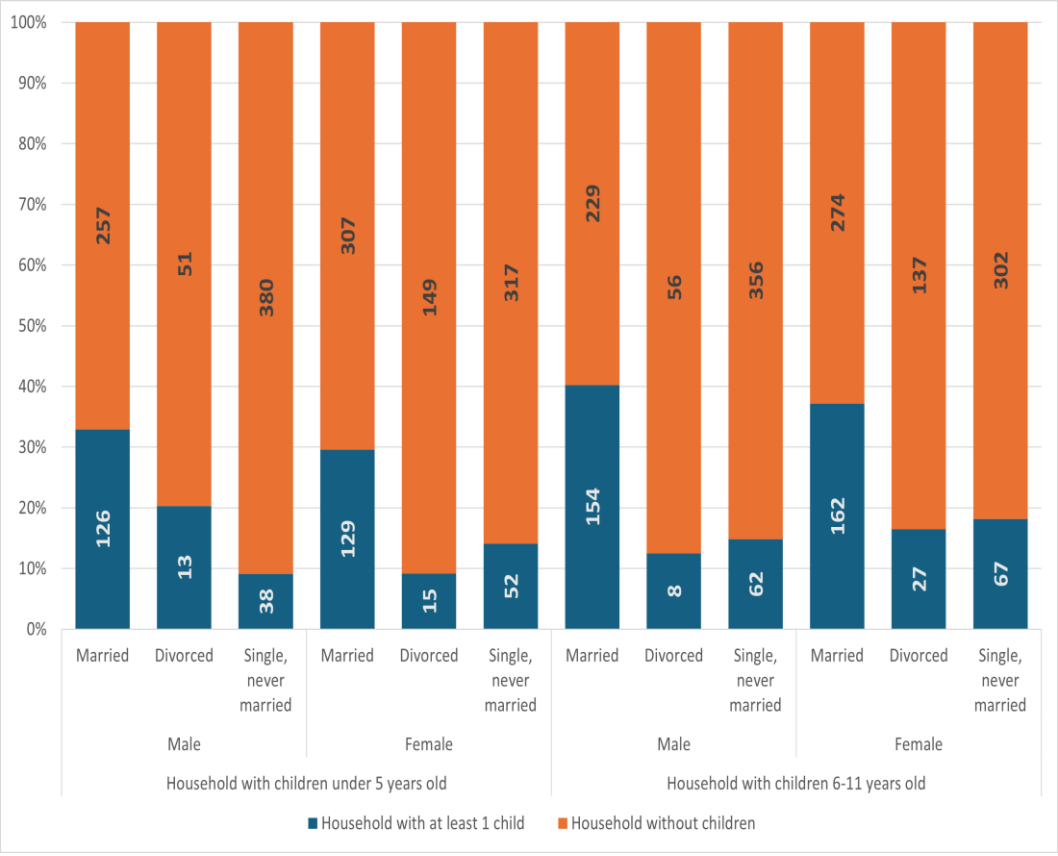
The difference between the peak of men and women corresponds with the standard practice that in marriage (or partnership), men tend to be older than women (Kohoutová 2014; ČSÚ 2023), which logically leads to women having children being younger than men.

Variable 2: Marital Status

Depending on the variable *Marital status*, the odds of living in a household with children were compared across different categories. Initially, three categories were used: „married", „single, never married", and „divorced". Later, marital status was simplified into two broader categories: „in partnership" and „single". The category of „in partnership" included both married individuals and those in a registered partnership. Unfortunately, the data source does not allow us to distinguish factual (cohabiting) partnerships. Respondents in such relationships are therefore recorded as „single".

As displayed in the chart below, many respondents with children of both categories live in marriage across both genders.

Figure 2: Respondents Living in Households with Children According to Marital Status and Gender (*Number of Respondents*).



The following table displays the odds of living in households with children of a certain age according to gender and marital status.

The odds of living in a household with children of both age groups are significantly higher for married respondents compared to single, never-married respondents. This outcome suggests that the Czech population still considers marriage essential to starting a family, even with the change in social norms towards marriage. According to some researchers, a married couple's relationship seems more durable and generally lasts longer than in the case of increasingly more frequent cohabitation (Kuchařová et al. 2020).

This statement is consistent with the merged categories' results at the bottom of the following table. For both genders and age categories of children, respondents in marriage or registered partnership have higher odds of living in households with children.

Divorced men have 2.6 times the odds of living in a household with children than single, never married men. This case may reflect the cohabitation of the divorced man with his partner and her children from her previous relationship. In the case of partnership breakdown, it is prevalent for children in the Czech Republic to stay in one household with the mother (Höhne and Paloncyová 2021).

Since divorced women have even lower odds of living in households with children, we could assume that women with children tend to get married even after a previous divorce.

Widowed respondents were omitted since the number of such young partners was very low, which would only lead to potential bias in the model. The number of divorced men in the dataset was relatively low, so the odds for this category should be interpreted with caution.

Table 3: Odds of Living in a Household with Children According to Gender and Marital Status (*With Single, Never-Married Respondents as the Reference Category*).

	Odds of living in households with children under 5 years old compared to single, never-married respondents		**Odds of living in households with children between 6 and 11 years old compared to single, never-married respondents**	
Marital Status	**Male**	**Female**	**Male**	**Female**
Married - Single, never-married	**4.90**	**2.56**	**3.86**	**2.67**
Divorced - Single, never-married	**2.55**	**1.64**	**1.22**	**1.12**
In partnership - Single	**4.15**	**2.90**	**3.97**	**2.80**

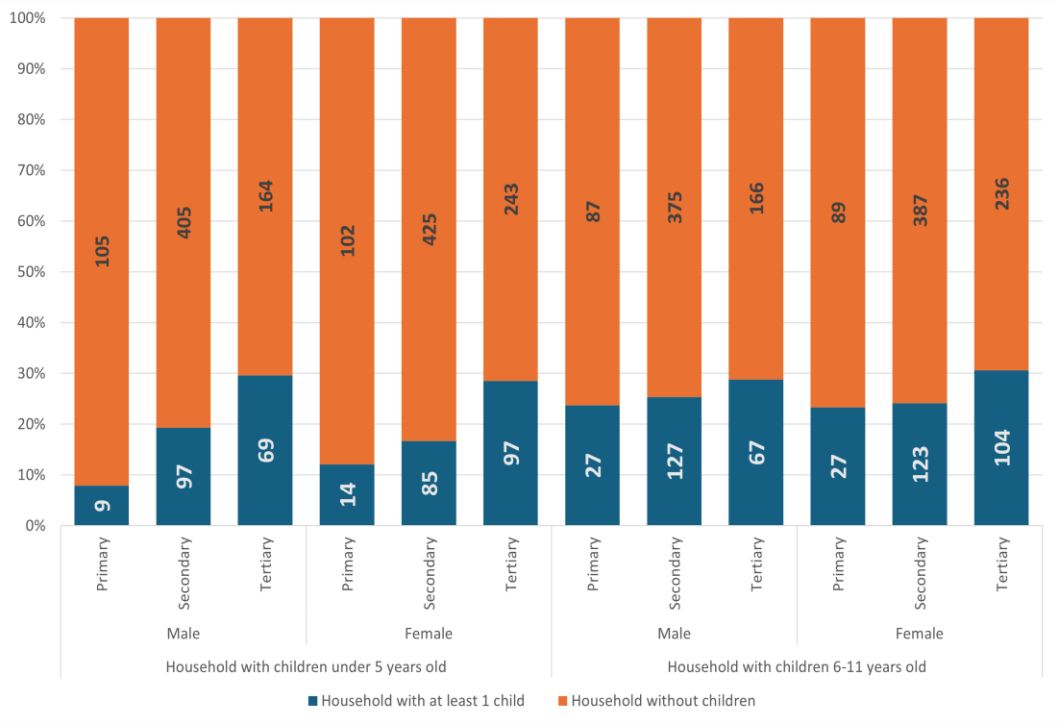
Variable 3: Completed Education

The variable *Highest completed education* is recorded in three categories:

- **Primary education**: Respondents with completed elementary school (generally 9 years of attendance).
- **Secondary education**: Respondents who completed high school with or without the graduation exam (generally 3 to 4 years following elementary school).
- **Tertiary education**: Respondents who achieved an academic degree at an institution of tertiary education.

The chart below shows a trend in the youngest children section. There is an increasing frequency of respondents living in households with a higher level of completed education. This is no longer visible for older children.

Figure 3: Respondents Living in Households with Children According to Education Level and Gender (*Number of Respondents*).



The tendencies mentioned above are confirmed by the odds of living in households with children. These relationships are the same for both genders and both age categories of children.

The highest odds of living in a household with children are among tertiary-educated respondents. Men with tertiary education have almost 5 times the odds of living in a household with the youngest children than men with only primary education. Tertiary-educated women have almost 3 times the odds of living in households with the youngest children than primarily educated women.

Both men and women who achieved secondary education have higher odds of living in households with the youngest children than primarily educated men and women.

This can also be said for the odds of living in households with older children; the differences between secondary and tertiary education are insignificant.

Table 4: Odds of Living in a Household with Children According to Gender and Education Level (*With Respondents with Primary Education as the Reference Category*).

	Odds of living in households with children under 5 years old compared to respondents with only primary education		**Odds of living in households with children between 6 and 11 years old compared to respondents with only primary education**	
Completed Education	**Male**	**Female**	**Male**	**Female**
Secondary – Primary	**2.79**	**1.45**	**1.09**	**1.09**
Tertiary – Primary	**4.91**	**2.91**	**1.30**	**1.45**

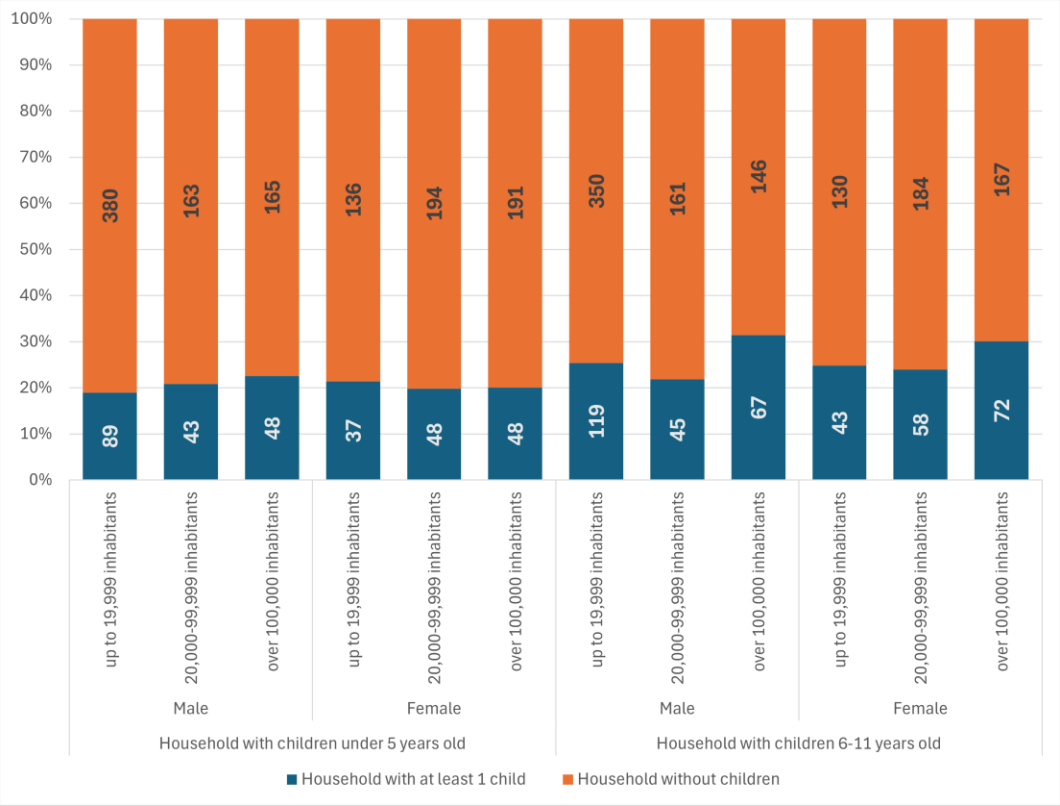
Variable 4: Municipality Size

The variable *Municipality size* tries to explain the differences between the family planning behavior in cities versus the dynamics seen in rural parts of the Czech Republic and the smaller towns. The scale for this variable was chosen as follows:

- **Municipalities up to 19,999 inhabitants** include smaller towns and rural municipalities.
- **Municipalities with 20,000 to 99,999 inhabitants** include most regional capitals and other middle-sized towns. Examples of this category for better understanding are Náchod and Mělník on the lower end of the category, both with approximately 20,000 inhabitants. The biggest cities included in this category are Pardubice, Hradec Králové, and České Budějovice, which are below the 100,000-inhabitant limit.
- **Municipalities over 100,000 inhabitants** include Prague and the largest regional capitals Brno, Ostrava, Plzeň, Liberec, and Olomouc.

At first glance at chart 4, there are no significant differences between the groups of respondents depending on the size of the municipality in which they live.

Figure 4: Respondents Living in Households with Children According to Municipality Size and Gender (*Number of Respondents*).



A similar picture can be drawn from the odds ratios in the table below. Since the odds ratios are around the value of 1, we would not assume there is much of a difference between the specific size categories of municipalities.

Table 5: Odds of Living in Households With Children According to Gender and Municipality Size (*With Respondents Living in Small Municipalities as the Reference Category*).

	Odds of living in households with children under 5 years old compared to respondents living in small municipalities		**Odds of living in households with children between 6 and 11 years old compared to respondents living in small municipalities**	
Municipality Size	**Male**	**Female**	**Male**	**Female**
20,000 to 99,999 – up to 19,999	**1.13**	**1.03**	**1.22**	**1.10**
over 100,000 – up to 19,999	**1.24**	**1.01**	**1.35**	**1.24**

Variable 5: Economic Status

A variable representing the economic activity of a respondent is the one that gives us the most in-depth view of the differences between men and women, already from the structure of respondents according to gender and their work status. All categories of the variable *Economic status* are displayed in the chart below and aim to describe the entire spectrum of work contracts in households.

For the specific age range for which the analysis is performed, it was reasonable to omit the category „retired" since it contained only a few observations. The category „homemaker" was omitted entirely for male respondents because it also had only a few valid records.

We also executed the binary logistics regression on a simplified model for simple interpretation. This model only considered binary independent variables with categories „working" and „not working." This way, we were trying to underline the relationship between having children and having an income.

As seen in the chart below, the share of respondents living with children differs across economic status categories. As expected, the highest share of households with children is amongst homemaking women, especially children under 5 years old.

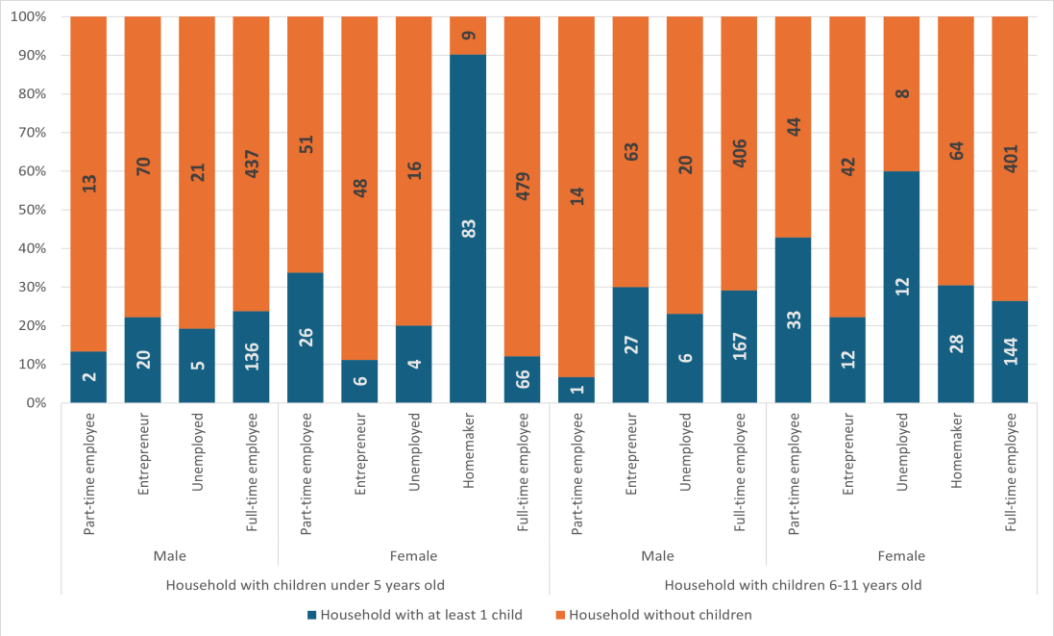
The odds of living in households with children provide valuable insight into gender roles in Czech households. Men are mainly the breadwinners; meanwhile, women tend to accommodate their careers to be able to care for their families. That means they usually stay home on parental leave and are only part-time employees as their children grow older.

The highest odds of living in households with the youngest children can be found amongst homemaking women. This is no surprise, as the children are the reason these women are not currently in the labor market. Also, part-time working women have 3.7 times the odds of living in households with the youngest children than full-time working women. Moreover, they have 2.1 times the odds of living in households with older children than women working full-time. This means that women prefer lower work contracts even when their children enter school age. This supports the assumption that caregiving and household responsibilities continue to be expected from women even after they return to the labor market.

With a glance at the odds ratio between working and not-working women, we can see that women have almost 10 times lower odds of living in households with younger children when they are not working than

women who are working. Women have 1.3 times lower odds of living in households with children between 6 and 11 years when they are working compared to women who are working. This confirms the hypothesis that women enter the workforce when their children are older. However, even when their children enter younger school age, they still tend to accommodate their career to them.

Figure 5: Respondents Living in Households with Children According to Economic Status and Gender (*Number of Respondents*).



Men have lower odds of living in households with children if their work contract is anything else than full-time employment. The only exceptions are entrepreneurs with older children. This finding supports the assumption that men are still primarily perceived as breadwinners within families—a role that is difficult to fulfill with a lower income typically associated with part-time or otherwise reduced employment. The paired relationship between working and non-working men also confirms the relationship. Working men have 1.8 times the odds of living in households with children under 5 years of age and 2.4 times the odds of living in households with older children than men who are not working.

The results of the conducted logistic regression are consistent with the broader characteristics of the Czech labor market and prevailing cultural expectations. The Czech labor market remains strongly segmented by gender, with women facing limited opportunities for part-time or flexible employment despite relatively high overall flexibility in working time arrangements. The preference for full-time contracts and the lack of structural support, such as accessible childcare for children under three, often push mothers out of the workforce or into long career breaks. In contrast to Western EU countries, where institutional support enables better work-family reconciliation, Czechia continues to stay behind, which contributes to lower maternal employment and potentially affects fertility outcomes (Frömmelová and Hon 2024).

These patterns can also be interpreted considering the structural features of the Czech labor market. Despite ongoing public discourse on family-friendly employment, the actual availability of flexible or alternative work arrangements remains limited, particularly for women with young children (Frömmelová and Hon

2024). Employers tend to favor traditional, full-time contracts, and part-time positions are not only scarce but often associated with lower wages and reduced career prospects. This institutional rigidity creates significant barriers for mothers seeking to maintain continuous labor market participation while managing family responsibilities. As a result, many women either exit the workforce temporarily or accept less stable or underpaid forms of employment, reinforcing gender disparities in both income and career advancement (Paloncyová et al. 2023).

Table 6: Odds of Living in Households with Children According to Gender and Economic Status (*With Respondents Working Full-Time as the Reference Category*).

	Odds of living in households with children under 5 years old compared to respondents working full-time		**Odds of living in households with children between 6 and 11 years old compared to respondents working full-time**	
Economic Status	**Male**	**Female**	**Male**	**Female**
Part-time – Full-time	**2.20**	**3.70**	**5.57**	**2.09**
Entrepreneur – Full-time	**1.12**	**1.10**	**1.06**	**1.26**
Unemployed – Full-time	**1.31**	**1.81**	**1.37**	**4.18**
Homemaker – Full-time		**32.85**		**1.45**
Working – Not Working	**1.82**	**9.80**	**2.43**	**1.34**

Summary

The Czech Household Panel Survey provides unique data that enables us to observe fertility from the household perspective. This view facilitates interesting comparisons in terms of gender differences. It also makes it possible to relate the presence of a child in the household to the socioeconomic characteristics of the respondents. Of course, the approach has its limitations. For example, it does not provide information about the biological relationship between children and adults in shared households. It is important to acknowledge that the household-level proxy for fertility used in this study does not necessarily correspond to biological parenthood. As a result, the presence of children in the household may either overestimate or underestimate individual fertility behavior. However, this data set provided a lot of interesting new information that expands the current understanding of household fertility in the Czech Republic.

Although it is difficult to find clear patterns in social science research through quantitative analysis, it is possible to summarize a few considerations from the research that seem potentially plausible based on our data and procedure.

Marital Status as a Predictor of Fertility

In the Czech Republic, reproductive behavior is still significantly differentiated according to marital status despite the growing number of unmarried cohabitations. The variable proved significant and caused differences in household structure between married and unmarried respondents. Married men are more likely to share a household with children than men who have never been married. This fact undoubtedly also reflects that, after the breakup of a partnership, in most cases, the children are still cared for by a woman in the Czech Republic.

Municipality Size Differences

The size of the municipality did not appear to have a significant effect on household fertility, which, according to some research, may differ from that of other countries. Bivariate sorting suggested that the largest cities might be expected to have a lower proportion of childless households, probably due to better infrastructure, but the differences were relatively small.

Education and a Fertility Predictor

According to the results of the binary logistic regression, education appears to have a significant effect on fertility, as the odds of living in households with children are higher among higher-educated respondents (aged 25 to 44).

Labor Market and Fertility Divergence by Gender

The economic status variable showed a significant gender differentiation in the labor market in the Czech Republic. Part-time jobs and staying at home are in demand by women, especially in the case of a small child. It is likely that the quantification made here also supports the gender differences between entrepreneurs considered, with men and women choosing self-employment for different reasons and presumably in different areas of entrepreneurship. The results confirm that men are less likely to live in households with children unless they are in full-time employment, reflecting persistent expectations for men to act as primary earners. In contrast, women are more likely to have children when economically inactive or working part-time, which aligns with enduring cultural norms that associate caregiving and domestic responsibilities with women, even after they re-enter the labor market.

Findings concerning fertility patterns and associated factors align with the current state of knowledge in other countries, while at other times they reveal differences in the development trajectories of these countries. Specifically regarding studies relevant to Czech data, we observe the emergence of both parallels and divergences. For instance, as in the Czech Republic, significant gender differences in fertility-related life situations are evident, and marital status remains a strong factor associated with fertility (Brzozowska 2021). Similarly, in other post-socialist countries, reproductive behavior is influenced by labor market conditions, particularly the family-friendliness of employment systems, including the availability of flexible work arrangements, and by the broader importance of economic factors in society (Németh, Németh and Tőkés 2025; Frejka and Gietel-Basten 2016). Residential factors, which are relatively less influential in the Czech Republic, play a major role in shaping reproductive decisions in Slovakia (Nestorová Dická and Lipták 2024).

The identification of factors influencing reproductive decision-making is a complicated process. Still, its possibilities are greatly expanded with the current proliferation of computational software and especially with the increasing number of available microdata. These developments not only enhance our analytical capacities but also open new avenues for evidence-based policymaking. In light of the findings presented in this study, the following recommendations are suggested to guide practical applications and inform targeted interventions:

- Promoting flexible working arrangements, such as part-time employment or remote work, may facilitate a better balance between work and family responsibilities, particularly for women.

- Encouraging both parents to take parental leave could contribute to a more equal distribution of childcare and help reduce gender disparities in labor market participation.
- Ensuring sufficient capacity and quality of early childhood education and care services would enable parents, especially mothers, to return to paid work, at least part-time, at an earlier stage.

In the long term, well-designed economic and social policies addressing these factors could contribute to greater economic stability for families and positively influence their reproductive choices.

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Conflict of Interest Statement

The authors declare that they have no conflicts of interest regarding the publication of this manuscript.

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