

## Perceived consequences of the COVID-19 pandemic and childbearing intentions in Poland

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### Abstract

**Objective:** We aim to investigate how the perceived consequences of COVID-19 affect people's childbearing intentions in Poland.

**Background:** With the pandemic having an impact on virtually all spheres of people's lives, some evidence already exists that it will lead to fertility postponement, as people are reluctant to make their reproductive choices in such uncertain times.

**Method:** We analyse a nationally representative sample of 1000 respondents aged 18-49. In the sample, 234 respondents declared that they had intended to have a child before the outbreak of the pandemic and about 20% of them stated having postponed or foregone their intention because of COVID-19. We perform logistic regression analyses to verify which perceived consequences of the pandemic are most decisive for this choice. We supplement our analyses with insights from qualitative, open-ended question on the effects of the pandemic.

**Results:** We find that people's decision to postpone childbearing is related to respondents' perceived lower sense of financial security and worse mental well-being in the pandemic. In the model, where both factors are included, only mental well-being remains significant. Qualitative analyses point to several other factors important to fertility decisions in the pandemic, e.g., women's fear of lonely childbirth.

**Conclusion:** People's decision to postpone childbearing because of COVID-19 is mostly related to pandemic-induced financial insecurity and this effect seems to be mediated by the psychological reaction to the situation.

**Key words:** COVID-19, fertility, childbearing intentions, Poland



## 1. Introduction

Researchers have always found that decisions related to childbearing are loaded with uncertainty. This uncertainty has been recognized as a main reason for why declared intentions to have children do not go hand in hand with actual fertility (Morgan, 1981; Westoff & Ryder, 1977). Nowadays, uncertainty in reproductive decision-making constitutes an important research topic, as scholars recognize its various facets and sources (Bernardi et al., 2015; Campisi et al., 2020; Ní Bhrolcháin & Beaujouan, 2011; Vignoli, Bazzani, et al., 2020). It can be expected that the recent COVID-19 pandemic will vastly contribute to an increasing uncertainty among people, leading to fertility postponement.

The COVID-19 crisis introduced job and financial insecurity, led to poorer access to medical care, and negatively affected many other areas of life (Aassve et al., 2020; Lindberg et al., 2020). Many people are currently worried about their own and their loved ones' health, there is more stress and mental disorders, and today's world has become overall more uncertain (Carvalho Aguiar Melo & de Sousa Soares, 2020; Parlapani et al., 2020). The experience of lockdown, combined with a frequent increase of household duties (working from home, caring for children, as access to childcare and schools is limited) may strongly affect relationships within the family and, in particular, between the partners (Maiti et al., 2020). Such profound changes may lead to people re-evaluating their priorities and life goals – also in relation to childbearing.

The aim of this paper is to investigate the impact of the COVID-19 pandemic on fertility intentions in Poland. We used survey data collected on a sample of 1,000 men and women aged 18-49, representative of the Polish population of that age, gathered from a survey conducted in September 2020. We asked which aspects of people's lives have been most severely impacted by the pandemic and examined which of its consequences have been pivotal in making a decision to postpone or forego childbearing. The quantitative analyses are complemented with qualitative insights from an open-ended question, illustrating people's reproductive considerations in the face of the pandemic.

## 2. Fertility choices in the pre-pandemic era

Childbearing decisions continue to be the subject of intensive research, especially in the context of low fertility countries, where attention is drawn to the factors that limit these decisions (e.g., Billingsley & Ferrarini, 2014; Guzzo & Hayford, 2020; Philipov et al., 2006; Testa & Stephany, 2018). While numerous factors have been examined in this respect, we focus on three major areas, which were vividly discussed in the pre-pandemic era and which might become even more important with the COVID-19 outbreak.

First, changing gender roles and within-couple relations should be considered. “An incomplete gender revolution” is commonly seen as an important factor behind the very low fertility (Goldscheider et al., 2015; Raybould & Sear, 2021). As women have become more active in the labour market, a double burden with work and household duties makes them limit their fertility. Consequently, men's engagement in household and childcare, and overall larger gender equity seem necessary to increase fertility (Golscheider et al. 2015).

While there are some differences in findings depending on the institutional context or whether a transition to a first or subsequent children is considered, a vast body of evidence shows that men's engagement in domestic labour and childcare is linked to higher fertility desires and intentions (see: Raybould & Sears, 2021 for an extensive literature review). Moreover, a recent study conducted in four European countries showed that the effect of gender equity on fertility intentions is partially mediated by relationship satisfaction (Riederer et al., 2019). This reiterates the central role of the within-couple relationship for childbearing choices.

Second, the economic uncertainty is "a game-changer for European fertility dynamics" (Vignoli et al. 2020, p. 4). Numerous studies have shown that risk of unemployment and an unstable financial situation negatively affect people's fertility intentions as well as their realisation (Fahlén & Oláh, 2015, 2018; Kuhnt et al., 2020; Pailhé & Solaz, 2012; Schmitt, 2012). And fertility tends to decrease when economic conditions are less certain (Sobotka et al., 2011). The recent effects of the Great Recession amplified the importance of economic uncertainty for childbearing (Caltabiano et al., 2017; Comolli et al., 2021; Comolli & Vignoli, 2021; Comolli, 2017; Matysiak et al., 2020). Notably, while the effect of economic changes on fertility was found to be the strongest in countries most affected by the economic recession (Matysiak et al., 2020), financial and labour market uncertainty affects fertility decisions even in countries where basic material conditions are stable and the state is protective (Comolli et al., 2021).

Third, health issues need to be mentioned in relation to childbearing, in terms of reproductive health (Shreffler et al., 2016), but also in relation to general health status. It has been found that a substantial number of men and women indicate health problems are reasons for not intending to have a child (Sobotka & Testa, 2008). Those with chronic illnesses or in poor health might feel they would not bear the burdens of childcare and that their condition could have negative consequences for their offspring (Prunty et al., 2008; Schmidt et al., 2014; Syse et al., 2021). For women, additional fears related to how pregnancy might impact their health status is important (Prunty et al., 2008; Schmidt et al., 2014).

The year 2020 brought another health-related factor: the COVID-19 pandemic. But the impact of the pandemic on fertility goes far beyond health issues. The scale of the pandemic and various restrictions introduced to fight it have changed people's lives in numerous ways. And many of them may have a profound effect on fertility.

### **3. The COVID-19 pandemic and its possible consequences for fertility**

The coronavirus pandemic broke out at the beginning of 2020. In September 2020, when our study took place, the number of worldwide confirmed cases of COVID-19 exceeded 30 million (WHO, 2020). In comparison with the Spanish flu, SARS, MERS or Ebola, the SARS-CoV-2 virus has a relatively low mortality rate and affects mainly the vulnerable segments of population: elderly people or patients with co-morbidities (Dowd et al., 2020). It seems that COVID-19 does not have a big impact on the health of women of reproductive ages or on child mortality, which could lead to a rapid decline of fertility rates during the pandemic and to possible compensation behaviours afterwards (Voicu & Bădoi, 2020). However, apart from its biological impact on people, the epidemic causes serious social and

economic disruption (Voicu & Bădoi, 2020), which might also have a marked impact on people's childbearing choices (Aassve et al., 2020).

The mere fact of a family member suffering or dying from the infection may substantially worsen the material situation of the family. But on top of this direct effect of the pandemic, there is an indirect one related to quarantine policies and various restrictions introduced in many countries. These restrictions have profoundly changed the daily lives of many people around the world (Dawson & Golijani-Moghaddam, 2020).

The lockdown and the containment measures introduced because of the pandemic have taken a heavy toll on the global economy, impacting every sector (Nicola et al., 2020). An International Labour Organization report from September 2020 raises issues of workplace closures, as well as losses in working hours and income (International Labour Organization, 2020). Many employers, especially from small businesses, if they can operate at all, must operate far below their capabilities, due to a reduced demand for their services or social restrictions (Acs & Karpman, 2020). In the USA, the severity of the current economic downturn has been compared to the Great Depression of the 1930s (Galea & Abdalla, 2020). As economic uncertainty was discussed to be detrimental to fertility, the economic crisis caused by COVID-19 is likely to markedly contribute to this effect (Aassve et al., 2020; Voicu & Bădoi, 2020).

The sudden appearance of the SARS-CoV2 virus and the active spread of the disease continue to have a strong impact on health systems. The outbreak of the current pandemic has created various barriers to accessing sexual and reproductive health (SRH) services. Health systems in different countries give priority to COVID cases and other aspects of public health are not adequately addressed. This may be the reason for the current reluctance to have children (Hall et al., 2020; Lindberg et al., 2020). In addition, some people may decide to postpone a pregnancy because they are afraid that they themselves or their close ones might get sick (Voicu & Bădoi, 2020).

In more general terms, many studies indicate that the current pandemic has an overall negative impact on mental well-being: whether due to economic uncertainty, health-related issues, social isolations or any other COVID-related issues. The studies show increased rates of loneliness, distress, anxiety and depression (Balanzá-Martínez et al., 2020; Dawson & Golijani-Moghaddam, 2020; Groarke et al., 2020; Lebel et al., 2020). A higher level of stress was observed especially in people whose situation in the labour market is less certain due to the pandemic (Mimoun et al., 2020). This might also have a negative impact on decisions about parenthood (Aassve et al., 2016; Le Moglie et al., 2015).

In the context of high-income countries, there is probably just one mechanism that allows the pandemic to have a positive effect on fertility. Staying at home and spending more time with family may improve the quality of couple relationships and contribute to a desire for a larger family (Szabo et al., 2020; Voicu & Bădoi, 2020). However, economic uncertainty and stress, as well as an increase of household duties related to COVID (Kreyenfeld & Zinn, 2020) may also negatively impact relationships within the family (Maiti et al., 2020). Moreover, in the context of uneven division of labour within the household, when women are the main care-providers, the pandemic might increase their burden and limit fertility intentions.

Overall, any favourable effect on childbearing seems to be completely overshadowed by the various negative consequences of the pandemic. The pandemic amplifies economic

uncertainty, brings new health-related challenges and increases household burdens – all these factors were already found to have a detrimental effect on fertility in the pre-pandemic era. This effect is likely to magnify with COVID-19.

#### **4. Fertility intentions during the pandemic**

It is still too early to capture the effect of COVID-19 on actual birth rates. An innovative study of Wilde, Chen and Lohmann (2020) predicts a 15% decline in fertility rates in the USA in 2021, but time will show whether these expectations are accurate. Nevertheless, it is possible to investigate how the pandemic affects the process of reproductive decision-making. In particular, studying people's fertility intentions may inform us on how the pandemic and its consequences enter people's considerations when they think about becoming parents.

Fertility intentions are commonly perceived as direct predecessors of reproductive behaviours. They are defined as conscious, psychological states, which mediate between various explanatory factors and the behavioural outcome (Ajzen & Klobas, 2013; Bachrach & Morgan, 2013; Dommermuth et al., 2011; Miller, 2011). In theoretical models of reproductive behaviour, such as the Traits-Desire-Intention-Behaviour (TDIB) model proposed by Warren Miller (Miller, 1994, 2011) or the cognitive-social model of fertility intentions (Bachrach & Morgan, 2013), intentions are the closest to the actual reproductive behaviour. But, as they strongly depend on external factors (available resources and opportunities), they are also the most volatile. People's response to changing conditions is reflected first and foremost in their intentions. The impact of the current pandemic on fertility is likely to be captured in childbearing intentions.

Only a few studies have been published on fertility intentions in the current pandemic, but they are highly informative. In the US, about one third of women declare that they are delaying or want to have fewer children because of the pandemic. These values are similar to those reported during the 2008 recession (Lindberg et al., 2020). It is thus likely that the negative effect of the pandemic on fertility will be at least as large as the effect of the recession. Also, in the European context, the impact of COVID-19 on childbearing plans has been recently documented. In Spain, individuals who expected the pandemic to have a negative effect on their income were more likely to postpone their intention to have children and in Italy and the United Kingdom people were more likely to abandon this plan altogether (Luppi et al., 2020).

#### **5. The current study**

The aim of the current study is to examine the role of the COVID-19 pandemic and its various consequences for people's fertility intentions in Poland. A steady fertility decline has been observed in Poland since the 1980s. According to the Eurostat data, the total fertility rate (TFR) reached the lowest level of 1.22 in early 2003. Since then, the TFR has increased to slightly over 1.4 in recent years. As Poles continue to highly value parenthood,

the disjunction between desires and actual behaviour is an important research topic in this context (Mynarska & Styrz 2014). In the pre-pandemic Poland, unemployment and economic instability were shown to be central for people's fertility intentions and behaviours (Matysiak, 2009, 2011; Mynarska & Styrz, 2014). The role of women's employment for fertility is often discussed in relation to gender roles and Polish women's determination to combine work and family life (Kocot-Górecka, 2015; Matysiak & Mynarska, 2020). Finally, general health was also indicated as an important factor for childbearing in the country (Mynarska et al., 2015; Mynarska & Wróblewska, 2017). Given these findings, the COVID-19 can be expected to have a significant impact on childbearing decisions.

In our study, we consider various possible consequences of the pandemic, which might be important for people's childbearing choices. We ask what effect the pandemic has had on people's financial security, health concerns, interpersonal relations, household duties and overall subjective well-being. Next, we investigate whether in the Polish context those most severely affected by the pandemic are more likely to declare that they have postponed or foregone their intention to have a child as a result of COVID-19. As we consider the consequences of COVID-19 in various life spheres, we are able to determine which of them shows the strongest relation to the declared change in reproductive plans. Moreover, in order to better understand people's reactions to the pandemic and its role for their reproductive choices, we analyse the responses given to an open-ended question on that issue.

For the analyses, we employed recently collected data on Polish men and women of reproductive ages. The survey was conducted between 14 and 22 September 2020, shortly before the second wave of the pandemic. In Poland, the first SARS-CoV-2 infections were officially reported at the beginning of March 2020. Towards the end of March, numerous restrictive measures were introduced across the country ("lockdown"). Many of these measures were gradually ceased in May 2020. Before September 19th, the number of daily new cases had not exceeded 1,000. During the week of data collection for our study, the numbers fluctuated between 400 and 1,000 new cases a day. The second wave of the pandemic hit Poland a few weeks later and with much greater power (exceeding 20,000 new cases a day, towards the end of October). Consequently, the current study can be considered a very conservative test of the effect on COVID on fertility intentions. Although Poles were preparing for the second wave of the pandemic in September, only about half of them took the situation seriously (ARC Rynek i Opinia, 2020a, 2020b).

## 6. Sample and method

### 6.1 *Sample characteristics*

The study was conducted on 14-22 September 2020 on a sample of 1000 respondents (507 men and 493 women). The data were collected by the external research company IQS, which is certified by the Polish Association of Public Opinion and Market Research Firms. The certification confirms that the company adheres to the ICC/ESOMAR Code, developed by

International Chamber of Commerce and European Society for Opinion and Marketing Research. The code sets essential ethical and professional standards for those involved in market, opinion and social research and data analytics (the current version of the document can be found on ESOMAR webpage: [www.esomar.org](http://www.esomar.org)). The data were collected on-line (Computer Assisted Web Interviews). The sample was a quota sample, representative of the Polish population aged 18-49 (in terms of age structure, sex, education, and place of residence). Based on the ISQ on-line panel (the sampling frame), 3088 individuals were randomly selected, to whom the invitation to participate in the study was sent. All participants were informed about the details of the study and gave their consent to take part in the survey.

The age range of the respondents (18-49) was determined by the research purposes. As our aim is to identify the effect of the pandemic on people's fertility decisions, men and women of reproductive ages were interviewed. Individuals expecting a child were excluded from the study. The mean age for the total sample was 34.19 with the standard deviation of 8.66 (for men:  $M = 34.39$ ;  $SD = 8.66$ , for women:  $M = 33.99$ ;  $SD = 8.66$ ). The basic sample characteristics are presented in Table 1.

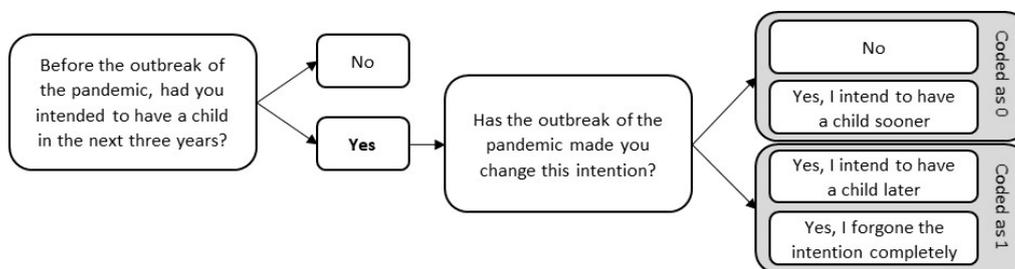
Table 1: Sample characteristics

Variable	Categories	Men (n=507)		Women (n=493)		All (n=1000)	
		n	%	n	%	n	%
Age	18-24	84	16.6	82	16.6	166	16.6
	25-34	166	32.7	160	32.5	326	32.6
	35-44	183	36.1	178	36.1	361	36.1
	45-49	74	14.6	73	14.8	147	14.7
Place of residence	Village	206	40.6	207	42.0	413	41.3
	City up to 49,000 residents	100	19.8	136	27.5	236	23.6
	City of 50,000 to 499,000 residents	131	25.9	106	21.5	237	23.7
	City of 500,000 or more residents	70	13.8	44	8.9	114	11.4
Education	Primary or lower secondary	45	8.9	48	9.7	93	9.3
	Basic vocation	92	18.1	137	27.8	229	22.9
	Secondary	150	29.6	139	28.2	289	28.9
	Post-secondary	48	9.5	55	11.2	103	10.3
Union status	Tertiary or higher	172	33.9	114	23.1	286	28.6
	Married	199	39.3	250	50.7	449	44.9
	Cohabiting	90	17.8	118	23.9	208	20.8
Direct experience with COVID-19	No co-resident partner	218	43.0	125	25.4	343	34.3
	Yes	66	13.0	69	14.0	135	13.5

## 6.2 Variables and measures

The main aim of our study is to examine a declared change of intention to have a child due to COVID-19 pandemic. This declared change is our key dependent variable and it was measured in two steps, very similar to how it was done in the recent study by Luppi, Arpino and Rosina (2020). First, the respondents were asked a retrospective question on whether directly before the outbreak of the COVID-19 pandemic they had intended to have a child in the next three years. Those who answered “yes” to this item (n=246) were asked a follow-up question: “Has the outbreak of the pandemic changed this intention?” Importantly, the respondents were asked specifically about the pandemic-related change to their fertility intentions, and not any change. The respondents chose one of four possible answers: (a) no; (b) yes, I intend to have a child sooner; (c) yes, I intend to have a child later; (d) yes, I have given up this intention completely. Since only a few respondents declared they intended to have a child sooner (n=4) or that they had forgone the intention completely (n=7), the respondents were grouped into two categories. In the first category, we included the respondents who had limited (postponed or foregone) their childbearing intention due to the COVID-19 pandemic (“Later or not at all” coded as 1). In the second category, the remaining respondents were included (“No change or sooner” coded as 0). The construction of our dependent variable—the declared change in childbearing intention due to COVID-19 pandemic—is schematically illustrated in figure 1.

*Figure 1:* Construction of the dependent variable: The declared change in fertility intention due to the COVID-19 pandemic



Our key explanatory variables relate to the perceived impact of the pandemic on various aspects of the respondents’ lives. Based on the literature review, we selected five different aspects: financial security, mental well-being, relations with their loved ones, concerns about their or their loved ones’ health, and the burdens of household duties. For each of these aspects, the respondents were asked to use a 7-point scale (from -3 do +3) and evaluate how it had changed in the pandemic. For the sense of financial security, mental well-being, and relations with their loved ones, the higher score indicates the situation in the pandemic has actually improved. For the concerns about their or their loved ones’ health, and their burdens of household duties, the higher score indicates that their concerns or burdens have increased in the pandemic.

In the analyses we also controlled for a set of socio-demographic characteristics: sex, age (continuous), number of children (continuous), union status (two categories: “single /

no co-resident partner” and “cohabiting or married”). Among the control variables, the age squared was also initially added in order to account for a non-linear relationship between age and dependent variable. The effect of this variable was close to zero in all analyses and it did not affect any other parameters of the models. Consequently, we have decided to drop it from analyses.

### 6.3 Analyses

In order to explain changes in fertility intentions caused by COVID-19, logistic regression was applied as the dependent variable is binary. This analysis is limited to the respondents who declared that they had intended to have a child (over the next three years) directly before the outbreak of the pandemic. We predicted the negative change (postponing or foregoing) of the intention to have a child (dependent variable) using the perceived personal consequences of COVID-19 in various life spheres (explanatory variables). The models were computed for each consequence separately and in the final step, the significant predictors were entered into one model. In all models, we controlled for the same set of socio-demographic characteristics (zero model). The analyses were conducted using IBM SPSS 26.0 software.

To check the robustness of the models, we performed all analyses with different combinations of the control variables and also additionally controlling for education and employment status of the respondents. All results were consistent across different specifications of the models, therefore only the final solutions are presented here. The results of the additional analyses are available upon request.

*Table 2:* The declared change in childbearing intentions due to COVID-19

	n	%
<b>Original sample size</b>	1,000	
Not intending to have a child before the pandemic	754	
<b>Sample of those intending to have a child before the pandemic</b>	246	
No change in intention	195	79.3
Intention to have a child sooner	4	1.6
Intention to have a child later	40	16.3
Forgone intention completely	7	2.8

The above analyses are supplemented with some qualitative insights. In the survey, all the respondents were given a chance to provide their comments on the current pandemic situation. In particular, they were asked the following open-ended question: “If the pandemic has changed your attitudes towards parenting or your intentions related to parenthood, please explain in a few words what this change was about and what it resulted from exactly?”. The answer to this question was not obligatory, but over half of the respondents left a comment. The answers were coded by the first author using an open coding technique, “bottom-up coding.” That means we did not have fixed, predefined categories, but allowed them to emerge from the data. The first author read all the comments, grouped them into categories of similar content and labelled them. Next, the

coding scheme was discussed and decided between the first and the second author and the coding was repeated and verified.

## 7. Results

### 7.1 Descriptive statistics

Among the 1,000 surveyed respondents, the majority (75.4%) declared they had not intended to have a child right before the outbreak of the pandemic. Almost one fourth of the sample (24.6%) expressed such an intention. Table 2 shows the distribution of these respondents according to their declared changes in the childbearing intentions due to the pandemic. While the vast majority did not change their fertility plans (79.3%), a significant share decided to postpone having children (16.3%). In Appendix 1, we provide detailed socio-demographic characteristics of the respondents divided by the declared impact of the pandemic on their intention to have a child.

As already noted in the Sample and Method section, few respondents declared that they had abandoned the intention to have a child completely or advanced this plan in time. Therefore, the responses were grouped into just two categories. For the first category, the COVID-19 pandemic did not have any negative impact on childbearing intentions – the respondents' plan to have a child remained unchanged or was even sped up (category 0). The second category consists of the respondents for whom the pandemic had a negative, limiting effect: they postponed or forewent their intention (category 1).

*Table 3:* The perceived effect of the pandemic on respondents' life (n=1,000)

Variable	Total sample (n=1,000)		Intended to have a child before the pandemic (n=246)		No change (or sooner) (n=199)		Later or not at all (n=47)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Changes in:								
- financial security	-0.53	1.432	-0.40	1.579	-0.31	1.555	-0.79	1.641
- mental well-being	-0.48	1.373	-0.34	1.524	-0.16	1.464	-1.11	1.550
- relationship with close ones	0.17	1.266	0.41	1.381	0.47	1.374	0.15	1.398
- concerns for health	0.88	1.479	1.06	1.540	1.10	1.508	0.87	1.676
- household duties	0.51	1.082	0.61	1.158	0.59	1.133	0.68	1.270

Table 3 shows the descriptive statistics for the explanatory variables: the perceived impact of COVID-19 on various spheres of people's lives. Even though we focus on the

respondents who intended to have a child before the outbreak of the pandemic, we display the means and standard deviations for the total sample as well. This way we are able to assess which aspects of people's life suffered the most. The results indicate that on average the sense of financial security and mental well-being has worsened, while concerns for health and household duties increased. Given that the answer ranged from -3 to 3, the impact of the pandemic does not seem to be very strong. Nonetheless, for those four questions a non-negligible share of respondents indicated that their situation in the pandemic is definitely worse than before (from 9.3% for mental well-being to 19.5% for health-related concerns, see Appendix 2). The weakest effect of the pandemics – as perceived by the respondents – was reported for the relationship with their close ones.

*Table 4:* Logistic regression: Predicting the declared negative change in intention to have a child (postponing or foregoing) due to selected consequences of the pandemic, n=246

Predictor	Model 0		Model 1		Model 2	
	B (SE B)	OR	B (SE B)	OR	B (SE B)	OR
Sex (ref. Male)	0.066 (0.036)	1.068	0.084 (0.353)	1.088	0.044 (0.367)	1.045
Age	0.025 (0.024)	1.025	0.024 (0.024)	1.025	0.028 (0.025)	1.028
Union status (ref. no coresident partner)						
- Married or cohabiting	0.536 (0.489)	1.708	0.631 (0.496)	1.879	0.821 (0.514)	2.272
Number of children	0.173 (0.155)	1.188	0.201 (0.158)	1.223	0.234 (0.166)	1.263
Pandemic-related changes in:						
Financial security			-0.235* (0.112)	0.790*		
Mental well-being					-0.543 (0.135)	0.581*
Relations with close ones						
Concerns for health						
Burdens of household duties						
Constant	-2.935 (0.956)	0.053	-3.177 (0.977)	0.042	-3.680 (1.040)	0.025
$\chi^2$	5.174		9.862		24.679	
df	4		5		5	
R <sup>2</sup> Nagelkerke	0.033		0.063		0.153	

## 7.2 Regression models

Table 4 shows the results of our multivariate analyses. For each logistic model, coefficients with standard errors and odds ratios are displayed. Each model predicts the negative adjustment (postponing or foregoing) of the intention to have a child based on a set of predictors. In the first step (Model 0) only socio-demographic (control) variables were entered into the model (sex, age, relationship status, number of children). None of them turned out to be statistically significant.

*Table 4:* Logistic regression: Predicting the declared negative change in intention to have a child (postponing or foregoing) due to selected consequences of the pandemic, n=246 (continued)

Predictor	Model 3		Model 4	
	B (SE B)	OR	B (SE B)	OR
Sex (ref. Male)	0.159 (0.357)	1.172	0.131 (0.354)	1.140
Age	0.024 (0.024)	1.025	0.027 (0.024)	1.027
Union status (ref. no coresident partner)				
- Married or cohabiting	0.574 (0.491)	1.776	0.611 (0.494)	1.842
Number of children	0.182 (0.157)	1.199	0.166 (0.156)	1.181
Pandemic-related changes in:				
Financial security				
Mental well-being				
Relations with close ones	-0.188 (0.122)	0.828		
Concerns for health			-0.126 (0.107)	0.881
Burdens of household duties				
Constant	-2.954 (0.965)	0.052	-2.962 (0.961)	0.052
$\chi^2$	7.603		6.557	
df	5		5	
R <sup>2</sup> Nagelkerke	0.049		0.042	

Table 4: Logistic regression: Predicting the declared negative change in intention to have a child (postponing or foregoing) due to selected consequences of the pandemic, n=246 (continued)

Predictor	Model 5		Model 6	
	B (SE B)	OR	B (SE B)	OR
Sex (ref. Male)	0.059 (0.353)	1.061	0.031 (0.37)	1.032
Age	0.025 (0.024)	1.025	0.029 (0.025)	1.030
Union status (ref. no coresident partner)				
- Married or cohabiting	0.531 (0.490)	1.701	0.808 (0.514)	2.243
Number of children	0.169 (0.156)	1.185	0.227 (0.166)	1.255
Pandemic-related changes in:				
Financial security			0.172 (0.158)	1.187
Mental well-being			<b>-0.657*</b> (0.172)	<b>0.518*</b>
Relations with close ones				
Concerns for health				
Burdens of household duties	0.029 (0.144)	1.030		
Constant	-2.940 (0.955)	0.053	-3.676 (1.045)	0.025
$\chi^2$	5.215		25.869	
df	5		6	
R <sup>2</sup> Nagelkerke	0.034		0.160	

Next, the explanatory variables—different consequences of the pandemic—were entered into the model individually. In models 1-5, the effect of each of those variables is shown, controlling for all socio-demographic characteristics. As the results indicate, not all of the experienced consequences of the pandemic were statistically significant. Only the “sense of financial security” (Model 1, B = -0.235, OR = 0.790) and “mental well-being” (Model 2, B = -0.543, OR = 0.581) showed a significant effect on fertility postponement due to the pandemic. In both cases, the effect was negative, indicating that an increase in financial security or mental well-being decreased the likelihood of postponing or abandoning the childbearing intention. To put it differently, as financial security or mental well-being deteriorated, the respondents were more likely to restrict their intention to have a child.

In the final step, the two significant predictors were entered into the regression equation simultaneously. In this step (Model 6), the role of financial security became insignificant and only mental well-being had a significant effect on the declared change in fertility intention (B = -0.657, OR = 0.518).

### 7.3 *Qualitative analyses*

At the end of the survey, the respondents were asked to provide additional comments or reflections on how the pandemic interferes with their childbearing plans or overall attitudes towards childbearing. Among the participants who intended to have a child before the pandemic, 126 (51.9%) commented. While the majority of them (n=78) were classified as 'no impact of the pandemic' (in line with quantitative findings), 48 individuals provided some insights into how and why the pandemic was a reason to change their fertility plans. The comments were coded into six categories. Table 5 displays these categories along with exemplary quotations from the respondents. The content of each category was analysed to gain insights into how the pandemic affects people's reproductive decision-making.

Most comments were related to health-related issues. Notably, concerns related to limited access to medical care during the pandemic dominated over any fears of getting infected. Eight respondents feared that they or, most importantly, their future child could get sick with COVID-19. At the same time, 20 comments were related to uncertainty of medical care and various barriers to accessing health services due to the pandemic.

Financial insecurity caused by the introduced lockdown measures was another important topic. In 14 cases, the respondents commented on their worsening material situation, (risk of) unemployment and unstable financial situation caused by the pandemic as important for their childbearing choices.

The last meaningful category relates to psychological wellbeing and interpersonal relations. We decided to label this category as a "general feeling of insecurity/uncertainty", since these comments reflected generalized feelings of loneliness, anxiety and depression, higher levels of stress or uncertainty, and in addition, the deterioration of relations with their loved ones. Such more generalized fears were reflected on by 10 respondents.

There were eight other comments on various negative impacts of the pandemic on the intentions to have children which did not fit with any previous category or were highly unclear. There were comments on the social and political situation in Poland (one person) or increased workload (one person), as well as more vague comments on "things being generally worse" or wishes for the pandemic to be over.

There were also three comments related to the pandemic having a facilitating effect on respondents' intention to have a child. In two cases, the respondents commented on a shift in their priorities ("we planned to try to get pregnant next year, but now we have changed our mind and we want it as soon as possible", Male, 35, one child). In one case, the respondent declared that they are now more careful in their attempts to get pregnant.

Among those who had not intended to have a child before the outbreak of COVID-19 pandemic, 402 individuals also provided comments in response to the open-ended question. Most of them (n=370) indicated that the pandemic had nothing to do with their childbearing plans. However, 32 respondents commented on various aspects of the pandemic that might have been important for their childbearing choices.

*Table 5: Responses to an open question on the effect of the COVID-19 pandemic on childbearing plans among the respondents who had intended to have a child before the outbreak of the pandemic. Coding categories and exemplary quotations (n=48)*

Categories	Exemplary quotations	N
<b>1. Concerns for health</b>		8
- Concerns for future child health	<i>The change is I am now more concerned for the child's health. (Female, 36, two children)</i> <i>I will wait for the vaccine to be invented, so that my child has a good start, without any health concerns. (Female, 20, two children)</i>	
- Concerns related to low immunity in pregnancy	<i>My immunity would be lower during the pregnancy, also given the much greater stress due to the pandemic. (Female, 33, two children)</i>	
- General COVID-related concerns about health	<i>I have concerns related to health during the epidemic. (Female, 36, one child)</i> <i>Uncertainty on what the next day brings, about health. (Female, 40, no children)</i>	
<b>2. Limited access to health care</b>		20
- Availability of doctors and medical services	<i>Lack of access to medical care. As the responsible person, I intended to check my health carefully before planning a pregnancy, now it is almost impossible. (Female, 30, no children)</i> <i>It is now virtually a miracle to access a doctor, get examined or diagnosed. (Male, 40, three children)</i>	
- No possibility to visit a hospital	<i>I would prefer to wait a bit longer before another baby appears because in the current situation I would be on my own in the hospital (relatives wouldn't be able to visit) and I would feel lonely. (Female, 34, one child)</i>	
- Lonely childbirth	<i>I am postponing plans to get pregnant for a couple of years. Reasons: lonely childbirth." (Female, 40, one child)</i>	
<b>3. Financial insecurity</b>		14
- Employment insecurity	<i>Situation in the labour market is uncertain now. (Male, 32, one child)</i> <i>The decision to have a child would only have been taken if I had a stable employment situation. Unfortunately, the labour market has deteriorated significantly. (Female 30, no children)</i> <i>Fears related to instability in the labour market, which could cause financial problems. (Male, 30, no children)</i>	
- Lower income	<i>We wanted to try for a child before the pandemic, but our financial situation kept getting worse and we postponed our plans. (Male, 31, one child)</i>	
<b>4. General sense of insecurity / uncertainty</b>		10
	<i>Times are uncertain, the uncertainty of tomorrow. (Female, 41, one child)</i> <i>I fear for the future. (Male, 49, no children)</i>	

*Note:* n indicates the number of respondents who mentioned each of the reasons for their decision to postpone childbearing; one respondent could indicate several reasons and therefore the number of responses does not total 48.

Mostly, they echoed the fears and worries presented above, expressed by the respondents in our analytical sample. Health-related concerns were dominant, but fears of the virus were more common ( $n=13$ ) than fears related to poor access to doctors and medical services ( $n=4$ ). Financial security ( $n=7$ ) and a general feeling of insecurity ( $n=5$ ) were also present in the comments. As these respondents had not planned to have a child before the pandemic, we may infer that various worries related to the pandemic affirmed their decision.

Notably, the remarks of the respondents who had not intended to have a child before the pandemic were at times very general, touching upon the social and political situation in the country or reflecting on interpersonal relations. Overall, 13 comments were coded into the category “other” in this group. In this category, there is one unique comment worth mentioning. A childless male respondent, aged 27, commented: “It is now much more difficult to find a partner”. This reflection draws our attention to factors that occur much earlier in the process of family formation that might have additional limiting effects on fertility.

## 8. Summary and discussion

The present study was designed to examine the effect of the COVID-19 pandemic and its various consequences on people's fertility intentions in Poland. First and foremost, we sought to determine the extent of fertility postponement caused by the outbreak of the pandemic in this country. Among men and women who had intended to have a child in the near future right before the pandemic, approximately one person in five revised their plan negatively. While the effect is certainly notable, it does not seem large if compared to the findings from other countries. In the study of Luppi et al. (2020) that covered five European countries (Italy, France, Germany, Spain and the UK), between 38% and 58% individuals declared that they had wanted to postpone their childbearing plans due to COVID-19. A meaningful share (17%-29%) said that they had forgone the plan altogether. Nevertheless, it does not mean that Poles are less responsive to the pandemic. First, Luppi et al. (2020) asked about childbearing intentions in the one year time perspective, while in our study a longer perspective was considered (three years). Second, our study took place in a low incidence period in Poland, right before the second wave of infections occurred. At the time of the study, there were no severe restrictions and many people may have felt that their life had returned to a pre-pandemic norm. Given this context, the negative effect of the pandemic on fertility plans should not be underestimated. Our findings provide a very conservative estimate of this impact. Further research on fertility intentions and actual reproductive behaviour in Poland is certainly called for, given a rapid increase in COVID-19 cases from October 2020. In fact, in December 2020 – February 2021, Statistics Poland reported a marked decrease in number of births both in absolute terms as well as per 1,000 of the population (Statistics Poland, 2021). The numbers are the lowest since early 2000s, when the lowest-low level of fertility was observed in the country. It is apparent that even in the early stage of the pandemic, Poles were somewhat reluctant to have children. Nonetheless, the actual, long term impact of the pandemic on fertility rates is yet to be seen.

It is an important contribution of our study that it offers insights into which aspects of people's lives were most severely impacted by the pandemic and were most consequential to people's childbearing choices. Based on the literature (Aassve et al., 2020; Hall et al., 2020; Lindberg et al., 2020; Voicu & Bădoi, 2020), we posited that people are likely to revise their fertility plans due to increased financial insecurity, health concerns or household duties during the pandemic, but also due to COVID-19 negatively affecting their relationship with their close ones and overall well-being. However, among the considered factors, only the financial situation and mental well-being turned out to play a significant role. Moreover, as both factors were considered simultaneously, the whole effect was captured by the variable related to the respondents' overall well-being. This might suggest that the effect of COVID-19-related financial security on fertility intentions is actually mediated by people's psychological reaction to it. In our analyses, we did not hypothesize about such a mediating mechanism and it needs to be properly verified in future studies. Nevertheless, the suggested interpretation seems feasible. It is not only financial insecurity that makes people revise their life plans, but also how they cope with it.

The COVID-19 pandemic has brought a new reality. Its impact on the daily life of millions of people is unprecedented and we have difficulties imagining what its long-term outcomes might be. Meanwhile, decisions about parenthood are linked to thinking about the future and people's imagination and narratives of the future might be at least as important for this decision as past or present circumstances (Vignoli, Bazzani, et al., 2020; Vignoli, Guetto, et al., 2020). No doubt, people predict their future economic prospects based on their previous experiences and currently available resources. But these experiences and resources might change their meaning in the face of the pandemic, which makes people's predictions even more uncertain, leading to increased anxiety and stress.

With such high uncertainty, people's psychological reactions to it seem pivotal. The question arises as to what social and mental resources might mitigate the negative consequences of the pandemic. A study conducted during the third week of the stay-at-home guidance in the United States has shown that psychological resilience in the face of the pandemic is related to some modifiable factors, and thus it is possible to bolster it (Killgore et al., 2020). It is necessary to investigate to what extent these factors may foster a positive adaptation to economic uncertainty.

While based on our quantitative findings, we emphasize the role of economic insecurity and psychological reactions to it, our qualitative analyses pointed to two other aspects important for fertility choices. First, issues related to limited access to health-care services were most frequently mentioned in relation to childbearing intentions. Respondents' fears concerning the limited availability of doctors and mothers being lonely in the hospital during and after childbirth were far more pronounced than fears of getting infected with COVID-19. This factor was unfortunately missing in our quantitative analyses but should not be overlooked in future investigations. Second, with just one comment from a respondent, our attention was drawn to the situation of single people.

At the time of the pandemic, finding a suitable partner is likely to be a much bigger problem than before. Limitation of daily social contacts can make it difficult to meet new people and build lasting relationships. This may be another, indirect reason for a reduced number of children, even among those who desire parenthood. While some research has been conducted on cohabitation and marriage intentions in the pandemic (Guetto et al.,

2020), it covered only individuals in romantic relationships. The question remains as to whether and in what way COVID-19 will change the dating patterns of young people, possibly impacting their union formation process.

With an intense research focus on the pandemic, our knowledge on its effect on people's lives grows on a daily basis. At the same time, many questions are still open and are likely to remain so until the actual effects of the COVID-19 pandemic can be assessed. It is however important to monitor people's responses to the situation in various life domains. Social support from family and friends, as well as care from a loved one were found to diminish negative psychological consequences of the pandemic (Killgore et al., 2020). At the same time, these negative consequences are likely to impede the processes of family formation and limit people's childbearing choices. From a long-term perspective, this might significantly change familial and social relations within society.

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## Appendix

*Table A.1:* The socio-demographic characteristics of the total sample (n=1000) and the analytic sample (n=246), divided by the declared impact of the pandemic on the respondents' intention to have a child

Variable	Total sample (n=1,000)		Intended to have a child before the pandemic (n=246)	
	n	%	n	%
Sex				
Male	507	50.7	115	46.7
Female	493	49.3	131	53.3
Age				
18-24	166	16.6	32	13.0
25-34	326	32.6	105	42.7
35-44	361	36.1	89	36.2
45-49	147	14.7	20	8.1
Union Status				
No co-resident partner	343	34.3	52	21.1
Married or cohabiting	657	65.7	194	78.9
Number of children				
Childless	378	37.8	90	36.6
One	237	23.7	92	37.4
Two or more	385	38.5	64	26.0
Education				
Low	376	37.6	81	32.9
Medium	338	33.8	78	31.7
High	286	28.6	87	35.4
Labour market				
Not working	338	33.8	64	26.0
Precarious job	265	26.5	72	29.3
Permanent job	397	39.7	110	44.7
	M	SD	M	SD
Age	34.19	8.66	33.16	7.42
Number of children	1.18	1.18	0.99	1.03

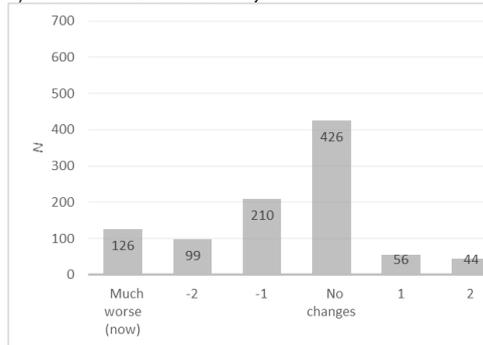
*Table A.1:* The socio-demographic characteristics of the total sample (n=1000) and the analytic sample (n=246), divided by the declared impact of the pandemic on the respondents' intention to have a child (continued)

Variable	No change in intention (or intends sooner) (n=199)		Negative change of intention: Later or not at all (n=47)	
	N	%	n	%
Sex				
Male	93	46.7	22	46.8
Female	106	53.3	25	53.2
Age				
18-24	28	14.1	4	8.5
25-34	83	41.7	22	46.8
35-44	74	37.2	15	31.9
45-49	14	7.0	6	12.8
Union Status				
No co-resident partner	46	23.1	6	12.8
Married or cohabiting	153	76.9	41	87.2
Number of children				
Childless	79	39.7	11	23.4
One	72	36.2	20	42.6
Two or more	48	24.1	16	34.0
Education				
Low	65	32.7	16	34.0
Medium	62	31.2	16	34.0
High	72	36.2	15	31.9
Labour market				
Not working	51	25.6	13	27.7
Precarious job	54	27.1	18	38.3
Permanent job	94	47.2	16	34.0
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Age	32.88	7.40	34.34	7.48
Number of children	0.93	1.04	1.21	0.93

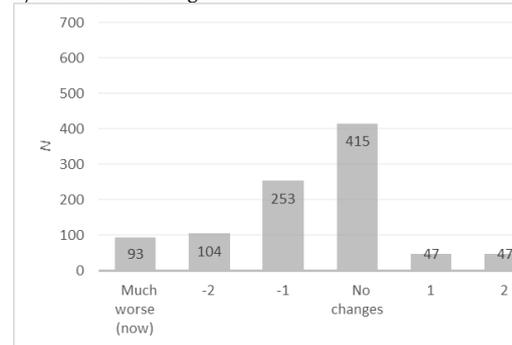
Figure A.1: Frequency distributions of the perceived effects of the pandemic on respondents' life (n=1,000)

Compared to the situation before the outbreak of the pandemic, how have the following aspects of your life changed? Currently, what is your:

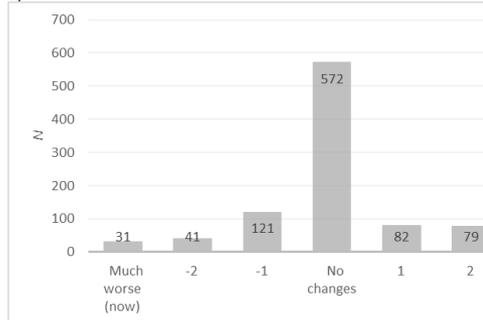
a) sense of financial security



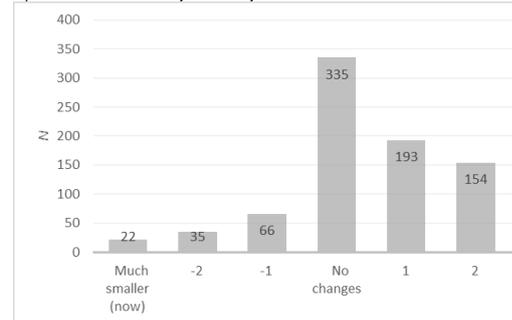
b) mental well-being



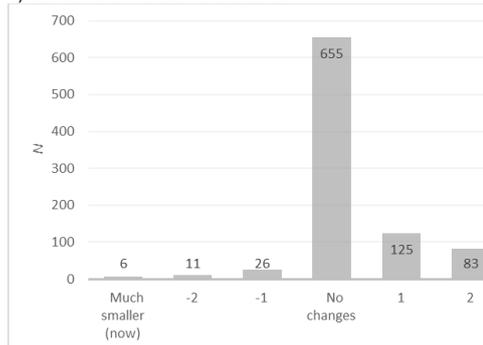
c) relations with loved ones



d) concerns about your or your loved ones' health



e) burdens of household duties



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## Information in German

### Deutscher Titel

Folgen der COVID-19-Pandemie und Reproduktionsabsichten in Polen

### Zusammenfassung

**Fragestellung:** Diese Studie untersucht, wie die wahrgenommenen Konsequenzen von COVID-19 die Fortpflanzungsabsichten der Polen beeinflussen.

**Hintergrund:** Die Pandemie betrifft praktisch alle Lebensbereiche der Menschen. Es gibt bereits einige Hinweise darauf, dass sie zu einer aufgeschobenen Fertilität führen wird, da die Menschen in solch unsicheren Zeiten zögern, reproduktive Entscheidungen zu treffen.

**Methode:** Wir analysieren eine bundesweit repräsentative Stichprobe von 1000 Befragten im Alter von 18-49 Jahren. In der Stichprobe der Studie gaben 234 Befragte an, dass sie vor dem Ausbruch der Pandemie beabsichtigten, ein Kind zu bekommen, und etwa 20 % gaben an, dass sie diese Absicht aufgrund von COVID-19 verschoben oder aufgegeben haben. Wir führen logistische Regressionsanalysen durch, um zu testen, welche wahrgenommenen Folgen der Pandemie für diese Wahl entscheidend sind. Wir ergänzen unsere Analysen mit Erkenntnissen aus qualitativen, offenen Fragen zu den Auswirkungen der Pandemie.

**Ergebnisse:** Wir finden, dass die Entscheidung der Menschen, ihre Pläne für Kinder zu verschieben, mit dem wahrgenommenen geringeren Gefühl der finanziellen Sicherheit und dem schlechteren psychologischen Wohlbefinden der Befragten während einer Pandemie zusammenhängt. In einem Modell, in dem beide Faktoren enthalten sind, bleibt nur das psychische Wohlbefinden signifikant. Qualitative Analysen weisen auf mehrere andere Faktoren hin, die für Fertilitätsentscheidungen in der Pandemie relevant sind, z. B. die Angst der Frauen, allein zu gebären.

**Schlussfolgerung:** Die Entscheidung, die Empfängnis aufgrund von COVID-19 zu verschieben, hängt hauptsächlich mit der pandemiebedingten finanziellen Unsicherheit zusammen und scheint durch die psychologische Reaktion auf die Situation vermittelt zu werden.

**Schlagwörter:** COVID-19, Fruchtbarkeit, Zeugungsabsichten, Polen

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