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## GLOBAL FERTILITY CHANGES IN THE CONTEXT OF THE COVID-19 PANDEMIC\*

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*The article presents an analysis of fertility dynamics in a number of countries around the world during and after the COVID-19 pandemic, that is from 2020 to 2022 (2021 for some countries). The study analyzed data from the Human Fertility Database, which contains monthly fertility data from countries worldwide. It also used data from the UN World Population Prospects 2022 to examine fertility trends in countries and regions from 2019 to 2021. The results of the study confirmed the hypotheses of no significant impact of the COVID-19 pandemic on fertility in the least developed countries and found a presumed significant negative impact on middle-developed countries in Latin America and South and East Asia, and questioned the lack of long-term negative effects of the pandemic on fertility in the world's richest and most developed countries.*

**Keywords:** *fertility, COVID-19, total fertility rate, global fertility decline.*

The COVID-19 pandemic from 2020 to 2022 has resulted in increased population mortality and many other negative consequences worldwide. The impact of the pandemic on population mortality has been a major focus of research attention on the population consequences of COVID-19 since its inception. Changes in population migration, caused primarily by the closure of borders around the world, have also received their share of attention. Much less attention has been paid to the impact of the pandemic on fertility.

At the beginning of the pandemic, it was often hypothesized that it was not so much COVID itself as the lockdowns that would lead to an increase in fertility, at least in developed countries with significant welfare support. Almost invariably such assumptions were expressed not in academic publications, but in media commentaries by speakers with no deep expertise in demographic issues. Such expectations can be described as

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outdated and do not reflect the current high levels of intra-family birth control in all developed and many developing countries (UN DESA 2019).

One of the major debates during the pandemic was triggered, among other things, by fears that the virus itself and/or the vaccines used might have a negative effect on fertility. An analysis of academic medical studies showed that no such effect was found (Chen *et al.* 2022). Thus, we exclude the influence of the medical factor COVID-19 on global fertility dynamics during and after the pandemic. Consequently, the main factor affecting the fertility dynamics during and after the pandemic is the change in people's demographic behavior. Of course, fertility dynamics during this period were determined, not only by the COVID-19 pandemic but also by underlying demographic, socio-economic and cultural factors that contributed to the gradual decline in global fertility. Nevertheless, at both country and global levels, the decline in fertility accelerated markedly in 2020, while fertility continued to fall at a much slower pace in 2021 (see Table 1). Most of the decline in the global total fertility rate (TFR) in 2018 was accounted for by China, where fertility then declined markedly, returning to its previous trend after a short-term spike in 2016–2017 triggered by the abolition of the one-family-one-child policy and the corresponding one-time realization of the accumulated potential of second births that had previously not occurred due to regulatory constraints. China's fertility also declined markedly in 2020, but this time China's contribution to the global fertility decline was much smaller.

Table 1

**Total fertility rate (TFR) of the world population and its trends, children per woman of childbearing age, 2015–2022**

year	2015	2016	2017	2018	2019	2020	2021
TFR	2.524	2.5256	2.5042	2.4433	2.4062	2.3485	2.3208
Change in TFR to previous year	–0.0289	0.0016	–0.0214	–0.0609	–0.0371	–0.0577	–0.0277

Source: UN Population Division 2022.

The first response to the pandemic in terms of fertility should have been to change women's reproductive intentions, that is, to change their birth calendar. Indeed, an analysis of studies in this area conducted at the height of the pandemic shows that up to 85 per cent of women in the United States reported the intention to postpone their planned childbearing. This included both those who decided to have a baby earlier because of the pandemic (24 %) and those who decided to postpone the childbirth to a more distant future (62 %). Meanwhile, women from more deprived socioeconomic groups were the most likely to report a desire to change reproductive their plans (Naya *et al.* 2021). In contrast, about 30 per cent of women in China reported intentions to postpone a previously planned birth. Such intentions were significantly and inversely associated primarily with trust in state institutions and state anti-COVID policies (Zhu *et al.* 2020). Although the expression of intentions did not always translate into an actual change in the birth calendar, further analysis showed that significant short-term postponement of births did occur.

At the onset of the pandemic, some researchers assumed that the global COVID-19 pandemic would lead to a decline in fertility in more developed countries because of economic losses, and an increase in fertility in the least developed countries because of slowing or even declining levels of development and worsening access to contraception

(Aassve *et al.* 2020). In fact, the least developed countries have not experienced increase in fertility. At the same time, fertility declines in these countries during the pandemic probably occurred as part of the maintenance of the pre-pandemic fertility trend, that is there is no evidence that the pandemic had a marked impact on fertility dynamics in the world's least developed countries.

For some selected developed countries, fertility dynamics can be analyzed not only at the level of annual number of births and total fertility rate but also at the level of monthly fertility. Data on short-term fertility fluctuations are available from the Human Fertility Database project (2023), which began collecting, calculating and publishing monthly fertility data for a number of countries during the pandemic.

Monthly fertility data during the pandemic in a number of countries have been analyzed by a team of demographers led by Tomas Sobotka (Sobotka *et al.* 2022). Their study is based on data up to April 2022. It concludes that the onset of the pandemic, with harsh and sometimes chaotic measures taken by some states, including lockdowns, did lead to a drop in fertility in almost all the countries observed, but that this drop was short-lived and its duration was probably determined mainly by the duration of the COVID-19 upswings (waves).

By the end of the period of research, fertility had increased again in most of the countries under study and in most cases had returned to pre-pandemic levels. Overall, the analysis of global fertility in 2021 suggests that the impact of the pandemic has ended and that fertility has returned to its normal trend in most countries. Other studies of the impact of the COVID-19 pandemic on fertility, also using data up to and including 2021, conclude that in high-income countries fertility declined as a result of the pandemic, but that the decline was short-lived and quickly reversed, while in middle- and low-income countries, in most cases no noticeable impact was found at all (PRB 2022).

However, given the time lag between the decision to conceive and the birth of a child, the last 'covid' births should have occurred in late 2022 and early 2023, as the pandemic (significant excess mortality) did not end until 2022. By now, monthly birth data up to the end of 2022 are available for most of the countries analyzed in the study by Sobotka and colleagues. We analyzed additional new data on monthly fertility in these countries up to December 2022–January 2023 from the same source, the Human Fertility Database. We found that the positive effect of the fertility recovery in 2021 observed by Sobotka and colleagues did not continue in 2022, and that fertility began to decline again after April 2022 in most countries (see Table 2), with the depth of the decline often exceeding the depth of the fertility decline due to the first waves of COVID-19.

Since the majority of the countries in the sample are European, it can be assumed that the decline in fertility is amplified by other factors, for example, such as the dynamics of the female population of childbearing age rather than the dynamics of fertility. Indeed, a mass of Ukrainian refugees arrived in most European countries in 2022, most of them were women of childbearing age, whose spouses, in most cases, remained in their home country. Thus, the migrant status and the physical absence of a spouse inevitably led to low fertility rates among these women. At the same time, their inclusion in the female population of childbearing age in the host countries may have resulted in lower fertility rates. We believe that this factor can only marginally explain the fertility dynamics in 2022 in only a small number of countries in Europe. At the same time, the fertility dynamics in most countries that did not experience a large influx of women in 2022 are not significantly different from the fertility dynamics in countries

that received large numbers of refugees. Families in some countries may have been inclined to reassess their reproductive intentions over longer periods of time, rather than months, when the duration of the COVID-19 pandemic extended well beyond about one and a half years. As the experience of the previous major global crisis of 2008–2009 has shown, the socio-economic consequences of the crisis, including its negative impact on fertility, persisted in many high-income countries for several years after the acute phase of the economic crisis had ended. Therefore, we believe that it is premature to draw definitive conclusions about the direct and indirect impact of the COVID-19 pandemic on global fertility based only on data for 2021.

Table 2

**Total fertility rate (TFR) and its change from September–November 2020 to December 2022, children per woman of childbearing age**

Country	TFR, September–November 2020	TFR, December 2022	TFR change
Lithuania	1.46	1.12	–0.34
Latvia	1.51	1.28	–0.23
Sweden	1.65	1.48	–0.17
Czech Republic	1.75	1.59	–0.16
Denmark	1.65	1.51	–0.14
Northern Ireland	1.71	1.6	–0.11
South Korea	0.83	0.73	–0.1
Germany	1.53	1.44	–0.09
Norway	1.44	1.36	–0.08
Finland	1.35	1.28	–0.07
France	1.76	1.7	–0.06
Netherlands	1.53	1.47	–0.06
Greece	1.37	1.32	–0.05
Austria	1.42	1.37	–0.05
Slovenia	1.64	1.6	–0.04
Scotland	1.26	1.23	–0.03
Japan	1.3	1.27	–0.03
Russia	1.52	1.49	–0.03
Belgium	1.53	1.52	–0.01
Hungary	1.59	1.58	–0.01
USA	1.6	1.59	–0.01
Italy	1.25	1.27	0.02
Spain	1.18	1.24	0.06
Israel	2.89	2.95	0.06
Portugal	1.4	1.54	0.14

Source: Human Fertility Database.

To analyze fertility dynamics during the COVID-19 pandemic in countries for which data are not available in the Human Fertility Database, we used the UN data from the latest revision of World Population Prospects (UN Population Division 2022). These data have a number of shortcomings and limitations. For example, the time series

of the current data ends in 2021. For many countries and regions of the world, even for 2021, the fertility data are roughly estimated. In addition, the UN fertility data are calculated for full calendar year, which complicates the analysis.

Some of the studies we have cited rightly point out that fertility in most countries of the world is well above replacement level and has been steadily declining before, during and after the pandemic as part of the demographic transition of these countries. It is therefore difficult to isolate the impact of the pandemic itself on fertility dynamics in such cases. Nevertheless, changes in the rate of fertility decline from 2021 to 2020 could potentially point to countries and regions of the world that experienced particular fertility changes during the first year of the COVID-19 pandemic.

Globally, the decline in fertility in 2021 to the rate of fertility decline in 2020 slowed by 0.035 children per woman, which may be due to the effect of an additional 'covidal' fertility decline in 2020 and then a compensatory removal of this effect in 2021. Among the large countries with incomplete demographic transition (fertility above replacement level), this effect was stronger than the world average in South Africa (0.047 children per woman), while in sub-Saharan Africa as a whole, it is detectable but extremely weak (0.002). In the least developed, lowest-income countries, there was no effect at all, which probably confirms that the COVID-19 pandemic has no discernible effect on fertility in these countries.

For countries and regions of the world that had already completed the demographic transition by the start of the COVID-19 pandemic, or were as close to it as possible (fertility at or below the population replacement level by the end of 2019), we analyzed the change in fertility between the end of 2021 and the last pre-pandemic year – 2019. In this category, the scope for dynamics in the total fertility rate (TFR) is so small that it is acceptable to compare countries and regions of the world by the absolute dynamics of the TFR. The largest declines in fertility during this period occurred among the world regions in East Asia (0.203 children per woman), South Asia (0.079) and Latin America (0.071), and among individual large countries in China (by 0.332 children per woman), Poland (0.110), Argentina (0.109), Mexico (0.094), Turkey (0.078), Iran (0.078) and India (0.078). Minimal fertility decline during this period occurred in the European Union (0.005) and high-income countries (0.032), and among selected large countries in Uzbekistan (no fertility decline) and Viet Nam (a decline of 0.004 children per woman).

The impact of the COVID-19 pandemic on global fertility is difficult to separate from the effects of other factors that have contributed to the decline in global fertility in recent years. At the same time, it can be argued that in the richest and most developed countries of the world, the pandemic could only directly affect the short-term birth calendar by shifting it by a few months. However, the long-term indirect impact of the socio-economic consequences of the pandemic on fertility in high-developed and high-income countries requires an analysis of fertility data for the post-COVID years, which cautiously suggests that the two-year pandemic and its aftermath will still have an impact on fertility in these countries. In the least developed countries and regions of the world, the impact of the pandemic on fertility is virtually non-existent.

Fertility was most affected during the pandemic in middle-income countries, especially in East and South Asia and Latin America. We believe that the effects of the pandemic have greatly accelerated the completion of the transition to low fertility, and that in the very near future many countries, at least in Latin America and Southeast Asia, will have some of the lowest fertility rates in the world.

The additional acceleration of the demographic transition, amplified during the COVID-19 pandemic in the form of a fertility decline well below the replacement level, which is already occurring in a number of developing countries and is likely to occur in the near future in many others, will allow these countries, on the one hand, to benefit from a growing demographic dividend in the coming decades (Grinin 2019), but it will also imply an accelerated ageing of the age structure of their populations in the future, raising the question of the need to develop and implement pro-natalist population policies and policies for accelerated adaptation to population ageing in a number of low- and middle-income countries, and probably even in some low-income countries.

#### NOTE

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