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ABSTRACT

Baby Bumps and Abortion Drop: Unpacking Fertility Trends During COVID-19 in Germany*

Although abortion trends can be highly informative for understanding fertility reactions amid COVID-19 pandemic, this perspective is rarely taken yet. In contrast to many other countries, Germany has reached above-average fertility rates in the first years of the pandemic. However, in-depth subgroup analyses of these trends are lacking. This paper aims at an in-depth investigation of changes in births and abortions in Germany from the start of the COVID-19 pandemic up to the end of 2021, with a specific focus on the context of public containment measures over time and relevant subgroups. Using augmented interrupted time series models, we analyze official birth and abortion statistics across different socio-demographic groups and regions. We first document two significant "baby bumps", the first arising from conceptions after the first lockdown, the second during the second lockdown. Abortions remained at similar levels during the first year of the pandemic but declined significantly in later periods during the first three quarters of 2021 when the healthcare system was under strain. The magnitude of the drop in abortions corresponds to 43% of the increase in births of the second baby bump. Subgroup analyses show that our findings apply to various socio-demographic groups and are most pronounced among individuals aged 25 to 39 years. The fertility patterns contrast with trends in many high-income countries. We argue that Germany's robust social policies were likely to have stabilized total fertility rates during the crisis; however, the drop in abortions could also have contributed to this. Our study draws a nuanced picture of how the COVID-19 health crisis affected reproductive health outcomes. Analyses of fertility patterns during crises should pay attention to changes in abortions.

JEL Classification: J16, J18, J13, J22

Keywords: abortions, fertility, births, health crisis, COVID-19, economic uncertainty, social policies

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1. Introduction

Throughout history, health and economic crises have had a significant impact on the human population and the demographic structure of societies. This has been shown, for example, for economic recessions (Goldstein et al., 2013; Sobotka et al., 2011), but also the Spanish flu as one of the most significant global health crises of the last century caused significant declines in live births of about 13% in affected countries (Aassve et al., 2020; Boberg-Fazlić et al., 2017; Wagner et al., 2020). Such demographic impacts have long-term consequences for education systems, labor markets and social security schemes.

The outbreak of the COVID-19 pandemic in early 2020 is one of the most significant international health and economic shocks the world has seen in the last eighty years. Based on previous experience, one expected the pandemic to suppress fertility in high-income countries due to economic hardship, economic uncertainty, impeded work-life balance, and reduced access to assisted reproductive technology (see, e.g., Aassve et al., 2020; Carballo & Corina, 2020). However, the existing empirical evidence shows that changes in the birth rate following the COVID-19 outbreak are very heterogeneous across countries, even across high-income countries (for an overview see: Aassve et al., 2021; Bujard & Andersson, 2024; Lappegård et al., 2023; Sobotka et al., 2023). While countries differ in their welfare systems to buffer economic and other crises, countries also responded differently to the COVID-19 pandemic with their public containment measures and adjustments in their social policies.

Relating birth outcomes to the course of the pandemic and studying changes across different socio-demographic groups and regions can help better understand the forces driving fertility amid crises. Moreover, in times of global health crises with challenged health systems and altered opportunity costs of children, analyses of birth rates should also pay attention to changes in abortions as a potential explanation. Although many high-income countries have adapted their abortion policies and protocols during periods of lockdown (Bojovic et al., 2021). Changes in abortions and fertility are rarely studied jointly, and there is still only limited evidence of changes in abortions during the pandemic (Fulcher et al., 2022; Kort et al., 2021; Vilain et al., 2022).

This study takes a unifying perspective and analyses changes in births and abortions throughout the different phases of the COVID-19 pandemic in its initial two years until December 2021. Our analysis is based on birth register data and abortion statistics from the Federal Statistical Office in Germany. We employ interrupted time series approaches, differentiating, for example, by age-specific birth and abortion rates, marital status, region, and the number of previous children. The detailed focus on one country allows us to characterize the changes in relation to the epidemiological evolution of the virus and the exact timing of public policy responses to the crisis within a given institutional framework.

Studying the case of Germany is particularly interesting due to its previous family policy transformation and historical context. In the past two decades, Germany has undergone a significant shift in family policies, moving closer to the Nordic model. However, there are still substantial differences between East and West Germany in terms of gender norms (Beringer et al., 2022; Jessen, 2022), child care infrastructure, female labor force participation (Zoch, 2020), and birth trends (Goldstein & Kreyenfeld 2011) which can be attributed to the socialist past of East Germany until 1990. It is worth noting that East Germany experienced a significant decline in birth numbers following the reunification in 1990, which was largely attributed to high levels of economic uncertainty (Chevalier & Marie, 2017). Given this background, it is interesting to study how both East and West Germany have been affected by the COVID-19 pandemic. The regional differences provide a valuable opportunity to analyze how varying socio-cultural contexts and policy landscapes impact birth and abortion trends during times of uncertainty.

Our paper contributes to different strands of the literature. First, we provide a nuanced analysis of how birth outcomes changed during the COVID-19 pandemic and in relation to public restrictions. The previous literature often focuses on aggregate changes in birth rates and country comparisons (Jdanov et al., 2022; Sobotka et al., 2022, Sobotka et al., 2023). Regarding subgroup differences in COVID-19 related changes in fertility, especially by parity, age, marriage, migration background and region, the evidence is heterogeneous (Arpino et al., 2021; Lappegård et al., 2023; Sobotka et al., 2023). Evidence on Germany focuses on aggregate measures (e.g. Bujard & Andersson, 2024); for subgroups, it is limited to descriptive statistics (Destatis, 2022a), with no tests of the statistical significance of the differences or considerations of previous time trends. We analyze in-depth the short-term birth increases in 2021 in Germany for various socio-demographic groups and for East and West

Germany. We document patterns differing from many other countries, which include stable birth rates at the onset of the pandemic, and two significant “baby bumps” following periods of restrictive containment measures. The baby bumps occur in East and West Germany, and mainly between the ages of 25-39. Increases are most pronounced for the first and second child.

Second, we contribute to the limited body of research on changes in abortions during the COVID-19 pandemic (Fulcher et al., 2022; Kort et al., 2021; Vilain et al., 2022). In many European countries, access to abortion services was difficult during periods with strict public containment measures (Bojovic et al., 2021). However, abortions and births are rarely analyzed together in the context of the COVDI-19 pandemic. We address this gap and complement our analysis of births with a unifying perspective on abortions. During the first year of the pandemic, Germany’s abortion rate remained relatively stable. However, in the first three quarters of 2021, during a period characterized by high infection numbers and a strained healthcare system, there was a significant decline in abortions, which was observed across various subgroups. Notably, the magnitude of the drop in abortions corresponds to 43% of the increase in births during the second surge in fertility.

2. Previous literature, potential effects and institutional background

2.1. COVID-19 related birth fluctuation in high-income countries

The COVID-19 pandemic caused significant short-term fluctuations in birth rates of high-income countries (Jdanov et al., 2022; Sobotka et al., 2022). In the first years of the pandemic, the Total Fertility Rate (TFR) showed ‘roller-coaster’ patterns (Sobotka et al., 2023). However, there are substantial variations in birth patterns among high-income countries during the COVID-19 pandemic. Focusing on the initial two years of the pandemic, 2020-2021, there was a sudden decline in several high-income countries starting in December 2020, approximately ten months after the World Health Organization declared COVID-19 an international public health emergency. The decrease was particularly pronounced (about 18-21%) in southern European countries (Arpino et al., 2021; Cozzani et al., 2022) and Japan (Ghaznavi et al., 2022), and less so (about 9-11%) in Russia or the US (Hamilton et al., 2021; Sobotka et al., 2023). After reaching its lowest point in January 2021, the TFR rebounded in most of these countries, even reaching a surplus in countries like the US, Israel, and the UK in the course of 2021 (Berrington, 2022; Sobotka et al., 2023). However, in some countries, such as Japan and Spain, the TFR remained lower than in previous years. A few countries observed no changes in their TFR until the end of 2021, particularly the Northern European countries (Lappegård et al., 2023). Given the varied patterns observed across different countries, it is important to also focus on country-specific contexts and subgroup analyses to better understand possible mechanisms.

The pandemic could affect birth rates through various channels. Economic uncertainty and increased unemployment could suppress fertility, as seen in the large decline in birth numbers in East Germany following the German reunification in 1990 (Chevalier & Marie, 2017), as well as the decline in several countries following the onset of the pandemic (Aassve et al., 2021; Sobotka et al., 2023). Subjective measures of uncertainty revealed an even stronger association with birth rates than objective measures of economic uncertainty (Tavares et al., 2022). Another possible reason for declining birth rates could be the restricted public life, leading to fewer social interactions and potentially less sexual activity. This, in turn, could result in reduced chances of pregnancy. Finally, parental well-being declined during the pandemic (Huebener et al., 2024; Huebener et al., 2021), while stress and depressive symptoms increased, which could deter couples from planning (further) children.

However, birth rates could also *increase* during times of crisis. With reduced economic activity, restricted public life, and uncertainty about the duration of the pandemic, the perceived opportunity costs of having children (earlier) decreased. Moreover, the shift to remote work for many individuals might have supported family planning decisions (Laß & Wooden, 2023). Another mechanism for increased birth rates during the pandemic could be a ‘cocooning effect’ (Bujard & Andersson, 2024), which may arise from a stronger focus on family during periods of strict containment measures, e.g. when social contacts are limited to the immediate family. Additionally, during lockdowns, couples may have more time for intimacy (Berrington et al., 2022). Social policies can also prevent declines in birth rates and potentially increase them through timing effects (Bailey et al., 2022; Sobotka et al., 2022; Sobotka et al., 2023). In Germany, for example, pregnant women receive job protection, and parents receive generous parental leave benefits for up to one year, with the option to claim job-protected parental leave for up to three years after childbirth. The timing hypothesis is supported by survey data showing that the mean intended number of children did not decline in Germany in 2021 (Krapf et al., 2023). An additional argument for increased birth rates could be restricted access to contraceptive technologies during periods of stress in healthcare systems.

Based on these arguments, it is ultimately an empirical question to investigate how birth rates evolved for different groups during different periods of the pandemic.

2.2. COVID-19 and abortions in high-income countries

Changes in abortion rates could also affect birth outcomes during the pandemic (Berrington et al., 2022; Kearney & Levine, 2022; Sobotka et al., 2023). Without changes in conceptions, changes in abortion rates would necessarily affect birth rates (Levine, 2004). However, there are few combined analyses of births and abortions during COVID-19. One exception is the study by Bailey et al. (2022), who modeled the consequences of reduced access to reproductive health centers in 2020 for low-income women. According to their model, as low-income women experienced reduced access to contraception and abortions, it is predicted that birth rates may rise due to an increased number of unplanned births. Thacher et al. (2024) find that births and abortions declined in one region in Southern Sweden, with significant differences by age. Abortions declined among women in the older age range but increased among younger women.

Other studies focus solely on abortion rates during COVID-19. They often rely on data from subregions and report varying changes. For example, in France, abortions did not decline during the first lockdown in spring 2020 but dropped after the second lockdown in May-June 2021 (Vilain et al., 2022). In Flanders, Belgium, abortion centers reported a decline in abortions during the first lockdown (Kort et al., 2021). A study from Massachusetts, US, shows an abortion decline of 20% from March to December 2020, despite no interruption to abortion services in the state (Fulcher et al., 2022). It is worth noting that clinical abortions have generally decreased, except for those conducted via telemedicine, while the demand for self-managed medical abortions has increased in many countries (Qaderi et al., 2023). Clinical abortion refers to any abortion performed within the formal healthcare system by a nurse, physician, or other medical professional. Self-managed abortion refers to any abortion performed without involving or contacting the formal medical system. This typically involves ordering medication from a clinician who operates within their legal scope of practice. Unlike birth rates, there is no systematic overview of abortion rates during COVID-19 in high-income countries.

Just like birth rates, abortions could be affected through various channels. First, the impacts of COVID-19 on health services typically included reduced access to sexual and reproductive health services (Aiken et al., 2021, Qaderi et al., 2023). Restricted access to abortion services during the health crisis could contribute to a decrease in abortion rates. Second, the reduced opportunity costs of having children in times of the pandemic, together with a cocooning effect, could increase the number of pregnancies carried to term and decrease the abortion rates. Third, restricted public life limited social interactions and potentially resulted in less sexual activity that could have led to abortions in the absence of the pandemic.

On the other hand, abortion rates could also *increase*. For example, increased intimacy of couples during lockdowns (Berrington et al., 2022) could have resulted in more conceptions that were not carried to term due to high levels of economic uncertainty. Economic hardship might also lead some individuals to seek abortions due to the perceived inability to support additional children, particularly in the face of an uncertain economic future. Additionally, increased levels of stress and lower levels of well-being could refrain parents from carrying an unintended pregnancy to term. Furthermore, several countries, including France, Italy, Belgium, the UK, and Germany, initiated policy or protocol changes that facilitated access to abortion services (Bojovic et al., 2021), which might ultimately result in increased abortion rates.

Which of these explanations might dominate, and whether changes in abortion rates are similar across regions and socio-demographic groups, is also an empirical question to be evaluated in the following.

2.3. Institutional and pandemic-related context in Germany

COVID-19's arrival in Germany in early 2020 was followed by several waves of infection. The government implemented various containment measures; however, their intensity and application varied throughout the pandemic. These measures included social distancing and strict restrictions on public (e.g., closures of leisure activity facilities and shops) and private life (e.g., contact restrictions). In early 2021, the German government imposed its second strict lockdown.

Following the COVID-19 outbreak, Germany adopted several relevant social policies. In March 2020, Germany's government extended eligibility for short-time work allowances (German 'Kurzarbeit'). To prevent dismissals, it allows employers to reduce their workers' working hours in times of crises, while the earnings loss is largely compensated by the social security system. It was proven to be an economic stabilizer during the 2009-recession (Goldstein et al., 2013). During the first lockdown in March and April 2020, over six million employees utilized paid short-time work (Bundesagentur für Arbeit, 2022). During the second lockdown in January and February 2021, about four million employees took advantage of it. Overall, the short-time work allowances contributed to stable employment rates and low levels of unemployment during the pandemic in Germany (Bundesagentur für Arbeit, 2022).

Additionally, the paid parental leave system was quickly adjusted to meet the needs of the crisis. From the beginning of pregnancy until the end of the parental leave period of up to three years after childbirth, employers generally cannot lay off workers. During the parental leave period, families would typically receive about 65% of the average net pre-birth earnings in the 12 months before childbirth, issued for a period of up to 14 months. Periods of short-time work or unemployment would typically reduce parental leave benefits. The effect of the "Act concerning parental leave allowance measures during the COVID-19 pandemic" was to exclude short-time work allowances or unemployment benefits from the calculation of parental allowances, thereby securing higher benefits for parents on parental leave.

For the following analysis, it is also helpful to know the general legal framework for abortions in Germany. Abortions are fundamentally subject to the federal criminal code (Strafgesetzbuch [StGB], 2024). "Whoever terminates a pregnancy incurs a penalty of imprisonment for a term not exceeding three years or a fine" (§218 StGB). However, abortions are not subject to punishment if they are conducted up to a gestational age of 12 weeks after conception (equivalent to approximately 14 weeks since the last menstrual period) and after certified counselling at a government-approved advisory center. Abortions are exempted from the criminal code if they are based on a medical indication, i.e., a pregnancy would result in a significant health risk for the pregnant person, or a criminal indication such as a pregnancy resulting from rape.

In Germany, surgical abortions are much more frequent than pharmaceutical abortions compared to other countries. The main difficulties encountered in accessing abortion services during the COVID-19 pandemic were caused by long delays in obtaining an appointment, and abortions not being explicitly declared as essential (Bojovic et al., 2021). The protocol was adapted, first to allow phone counselling and digital certification, and second, to permit pharmaceutical abortions via telemedicine. However, most abortions were still performed surgically (Moreau et al., 2021).

3. Data and empirical approach

3.1. Birth and abortion statistics

The data used to study trends in birth rates after the onset of the COVID-19 pandemic in Germany are obtained from the official birth statistics of the German Federal Statistical Office (Destatis, 2022a, 2023). The statistical offices conduct extensive plausibility checks to ensure data accuracy. Pandemic-related delays were subsequently and completely recorded, and a complete count of foreign women's births was also fully registered. The dataset contains information on the date of birth, mothers' place of residence, sex of the child, whether it was a single or multiple birth as well as certain demographic characteristics, such as whether the parents are married, the date, place and state of the parents' birth, and their nationality. It also includes the number of previous children born to the mother and the date of birth of the mother's previous child. For further information on data content, quality and accessibility, see Destatis (2023). Our analysis is based on 3.9 million live births that occurred in Germany between 2017 and 2021.

We combine the data on registered births with female population data from the Federal Statistical Office (Destatis, 2022b) to calculate Age-Specific Fertility Rates (ASFR) and Total Fertility Rates (TFR) on a monthly basis. The ASFR quantifies the number of children born per one thousand women for each age category, and our calculations span ages 15 to 49. To convert these monthly ASFR figures into the more frequently employed annual value, we extrapolate them to the year. The TFR is computed by aggregating all ASFR values per woman and year, thus representing the expected number of children a woman would give birth to if the current ASFR persisted throughout her childbearing years. The birth-related analyses are also performed separately by the biological birth order, marital status, nationality and region for East and West Germany, with Berlin included in East Germany. Berlin is included in East Germany due to its geographical position, historical characteristics, and socio-economic and demographic indicators that are closer to East German characteristics than to West German characteristics (e.g., childcare availability, birth and abortion rates, maternal employment rates). We further note that the population counts for the respective subgroup analyses are based on population projections.

In the second part of the analysis, we also study changes in abortion numbers following the outbreak of the COVID-19 pandemic. We use data from the Federal Statistical Office, which includes information on registered abortions performed in Germany (Destatis, 2022c). In comparison to birth outcomes, the abortion data is only available at the quarterly level instead of the monthly level. Moreover, abortion outcomes have a shorter time lag than birth outcomes when we relate them to the course of the pandemic, as they typically take place within twelve weeks after conception. For these two reasons, we also consider earlier data from 2015 to 2021, which overall provides a sufficiently large set of pre-pandemic information. Based on this information, we calculate the abortion rate as the number of abortions per 1.000 women aged 15 to 49 for each quarter and year. We multiply the abortion rate by four quarters to obtain the more commonly used annual number. This is our main outcome of interest. The data also provides information on women's family status, age, the number of previous children, and the indication for abortion (medical or criminal indication, or abortion in compliance with the counselling regulation). However, this administrative classification does not always reflect the complex reality, since it is often impossible to separate out medical necessity, criminal indication, and counselling regulation.

To characterize our samples of births and abortions in Germany, we report further descriptive statistics on our main data in Appendix Tables A.1 and A.2. Between 2017 and 2021, the mean TFR is 1.55, with a value of 1.51 for East Germany and 1.57 for West Germany. On average, we observe 65,319 births per month. Further descriptive birth statistics by age, parity, marital status, and nationality are reported in Appendix Tables A.1. With respect to abortions, the abortion rate per 1,000 women is 18.27, amounting to 24,953 abortions per quarter. Further details on abortions by gestational week, maternal age, indication, the presence of previous children, and marital status are reported in Appendix Table A.2.

To link changes in births and abortions to specific phases of the pandemic, we use daily information on the number of COVID-19 infections and a stringency index called the "Corona-Strenge-Index" (CSI, Healthcare-Datenplattform, 2023). The CSI is based on COVID-19 measures in different areas of life, collected for all German counties. It captures the stringency of measures across 23 categories on a daily basis from March 2020 using a scale from 0 (weak measures) to 100 (strong measures). The index methodologically follows the Oxford Stringency Index (Hale et al., 2021), but we have utilized the CSI as it is a standard data source in Germany to evaluate COVID-19 related containment measures (see, e.g., Huebener et al., 2024).

3.2. Empirical approach

To analyze changes in births and abortions in Germany following the outbreak of the COVID-19 pandemic, we build on the idea of interrupted time series (ITS) analyses (Bernal et al., 2016; Shadish et al., 2002). ITS models are specifically designed to assess whether events (such as public health shocks or the introduction of policies) have led to a shift in the level and trend of a time series. These models are particularly valuable when events or policies impact the entire population and there is no unaffected control group available. They have been used in research to evaluate the effects of public policies in general (Muller, 2004) or the impact of the COVID-19 pandemic specifically (Sim et al., 2023). The basic form of an ITS model in our application is the following:

$$y_t = \alpha_0 + \alpha_1 T + \beta_1 COVID19 + \beta_2 PostT + \varepsilon_t$$

where y_t is the birth outcome at time t; *T* is a continuous variable of the calendar time running from *T*=1 for January 2017 to *T*=60 for December 2021; COVID19 is a dummy variable that takes the value zero until October 2020 and the value one from November 2020 onward. Given that the first COVID-19 cases were discovered in Germany in late January 2020 and the first lockdown began in March 2020, we would not expect to see changes in birth outcomes before November 2020 (considering the average length of pregnancy is 266 days). *PostT* is a continuous variable indicating the time in months that has passed since the pandemic started (with a value of zero before it). β_1 captures level shifts in our outcome variable, while β_2 captures changes in the time trend.

For our research purposes, we modify the basic ITS model in the following ways. First, we flexibly account for seasonality in birth outcomes, as visible in Figure 2 panels a and b, by including a set of 11 calendar month fixed effects (γ_m, dummies for February to December). Second, we relax assumptions on the timing of intercept shifts in birth outcomes and functional forms of the changed time trend that might arise with the pandemic. For example, conceptions might not react immediately but instead depend on the current state of infections and restrictions that vary substantially over the course of the pandemic. Therefore, we substitute the variables $COVID19$ and $PostT$ with a set of 24 dummy variables indicating the months January 2020 to December 2021 around the onset of the pandemic. Thereby, we can flexibly estimate changes in births in comparison to the preceding period and check potential trends prior to the pandemic that the model might not account for. We would not expect to see changes in birth rates before November 2020. Our main empirical model is then:

$$y_t = \alpha_0 + \alpha_1 T + \gamma_m + \sum_{l=Jan2020}^{Oct2020} \beta_l \times I(time = l) + \sum_{m=Nov2020}^{Dec2021} \beta_m \times I(time = m) + \varepsilon_t \qquad (1)$$

The coefficient α_0 is the intercept term, capturing birth outcomes at the beginning of our observation period prior to the pandemic; α_1 captures general linear time trends in birth outcomes, γ_m are calendar month fixed effects. The coefficients of primary interest for our analysis are β_l, to assess pre-trends, and β_m, to assess changes in TFR following the outbreak of the pandemic.

To summarize the change in TFR in an aggregated measure, we substitute the period-dummies in eq. 1, with a dummy $COVID19$ taking the value one for observations from November 2020 to December 2021, and zero for the period before. We estimate the following model:

$$y_t = \alpha_0 + \alpha_1 T + \gamma_m + \sum_{l=Jan2020}^{Oct2020} \beta_l \times I(time = l) + \beta_{covid} COVID19 + \varepsilon_t \qquad (2)$$

The notation follows analogously to eq. 1.

We base the abortion analyses on a similar framework. As data on abortions are only available at the quarterly level, the time period *t* now refers to the quarter of a year. We include data from the first quarter of 2015 through the fourth quarter of 2021 in our analysis. Furthermore, abortions are typically carried out within 12 weeks after conception, hence the time lag between the outbreak of the pandemic and potential changes in abortion numbers is shorter compared to birth outcomes. Responses in abortion outcomes would already be possible in the first quarter of 2020 (referred to as 2020Q1). Hence, our main empirical model to estimate changes in abortions is:

$$y_t = \alpha_0 + \alpha_1 T + \gamma_q + \sum_{l=2019Q1}^{2019Q4} \beta_l \times I(time = l) + \sum_{m=2020Q1}^{2021Q4} \beta_m \times I(time = m) + \varepsilon_t \qquad (1)$$

where y_t is the abortion outcome in quarter t. *T* is now a continuous variable of the calendar time running from *T*=1 in 2015Q1 to *T*=28 in 2021Q4, in order to account for general linear trends in abortions. γ_q captures quarter-fixed effects to account for seasonality. We include four dummy variables for the first to fourth quarter of 2019, such that the β_l coefficients allow us to evaluate pre-trends in the evolution of abortions prior to the pandemic. Additionally, we include a set of eight dummy variables for each quarter from 2020Q1 to 2021Q4. Once again, the β_m-coefficients are of primary interest as they estimate changes in abortions following the onset of the pandemic.

Analogously, we summarize COVID-19 related changes in abortions using the following model:

$$y_t = \alpha_0 + \alpha_1 T + \gamma_q + \sum_{l=2019Q1}^{2019Q4} \beta_l \times I(time = l) + \beta_{covid} COVID19 + \varepsilon_t \quad (4)$$

which substitutes the treatment quarter-dummies in eq. 3 with a dummy variable $COVID19$ taking the value one for observations from 2020Q1 to 2021Q4, and zero otherwise.

We use data from pre-pandemic periods to account for seasonality and general time trends that are typically subject to random shocks. Despite using population-level data instead of a sample, we provide standard errors to assess whether the observed differences during pre-pandemic periods are statistically significant. One concern for statistical inference in time series data is autocorrelation of the error term ε. It is much less of a concern when seasonality is accounted for (Bernal et al., 2016). Tests for auto correlation for our main outcomes, the TFR (d=1.51; Breusch–Godfrey test p-value=0.07) and the abortion rate (d=1.89; Breusch–Godfrey test p-value=0.77) cannot always reject autocorrelation in the error term. To account for potential autocorrelation, we estimate our models with OLS using Newey-West standard errors with one lag (Newey & West, 1987).

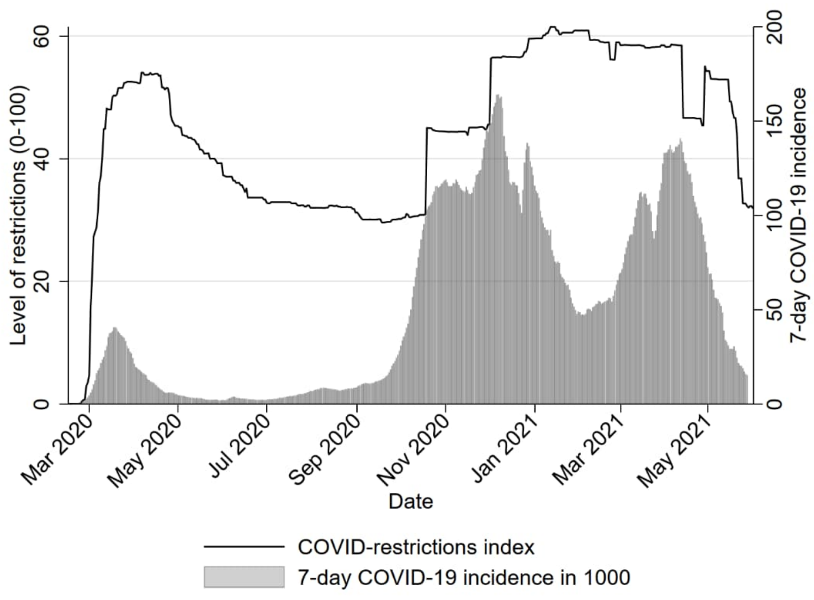
The estimated coefficients can be interpreted as the COVID-19 induced changes in birth outcomes if we assume that births and abortions would have evolved as before, following general time trends and seasonal patterns, in the absence of the pandemic and its associated policy measures. However, it is important to note that the validity of this assumption cannot be directly tested, and potential confounding factors or other unobserved events might challenge this assumption. To check the plausibility of the assumption, we investigate deviations from this trend in the periods prior to the pandemic and generally find no systematic deviations.

4. Results

4.1. Main results on birth and abortion rates

Figure 1 plots the daily 7-day incidence rate and the stringency index to characterize the course of the COVID-19 pandemic in Germany. It demonstrates that increases in the incidence of COVID-19 were followed by stricter public containment measures. After the first wave, containment measures were relaxed faster, while they were kept longer at more restrictive levels after the second wave of infections starting in October 2020.

Figure 1: COVID-19 infection numbers and public containment measures over time

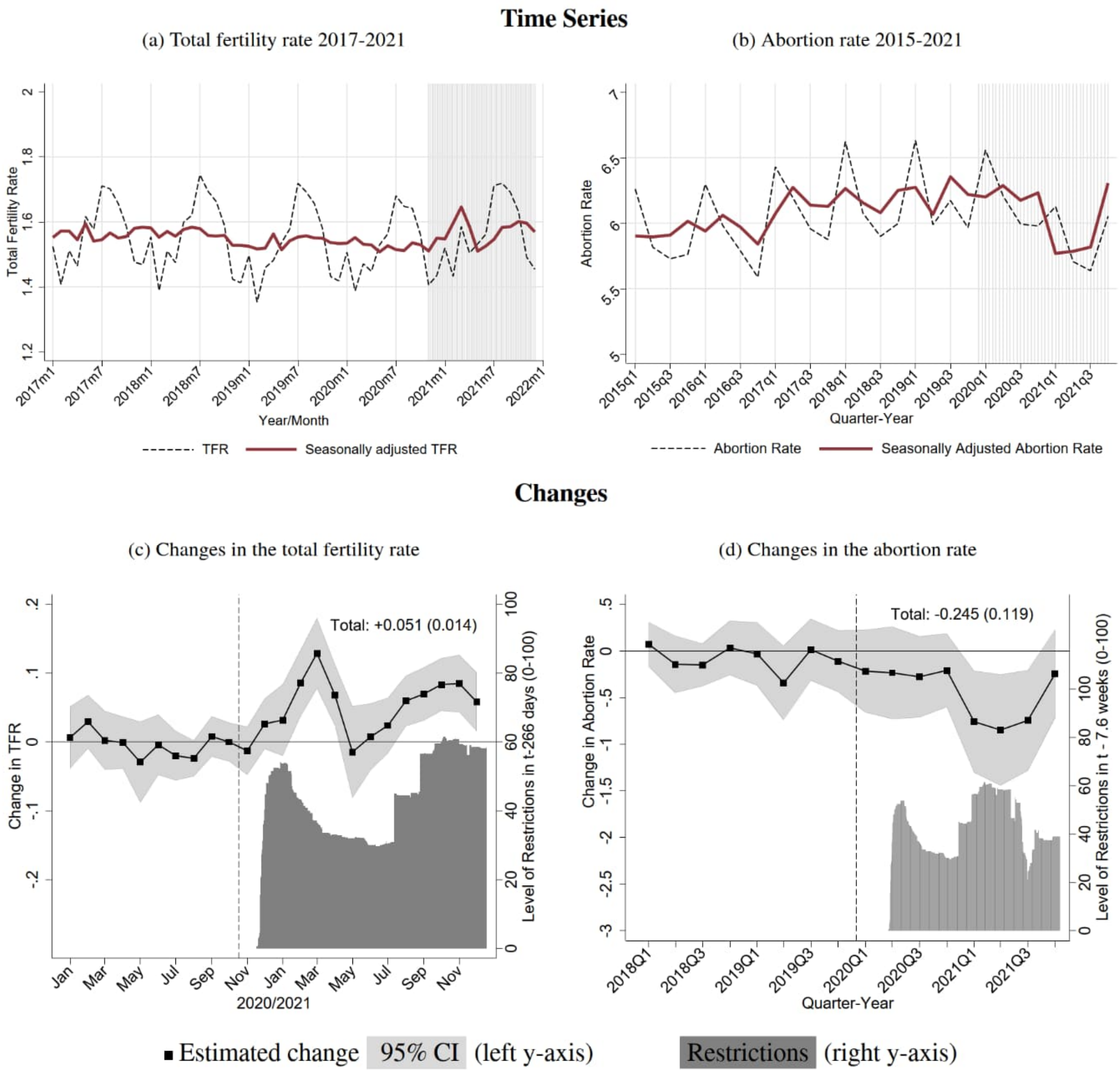


Notes: The figure plots the stringency index of public measures to contain the spread of COVID-19 (Corona-Strenge-Index, scale 0-100) and the 7-day COVID-19 incidence in Germany between March 2020 and June 2021.

Source: Own illustration based on Healthcare-Datenplattform (2023).

Figure 2, panel a, plots the evolution of the TFR from 2017 to 2021 and the seasonally adjusted TFR. Following the COVID-19 outbreak, we observe an unusual increase in the TFR in two waves until December 2021. To facilitate the visual comparison of the separate years, we include the seasonally adjusted monthly TFR for each year in Appendix Figure A.1 for each individual year. Figure 2, panel b, plots the abortion rate over time. Prior to the pandemic, the abortion rate increased slightly over time. After the onset of the pandemic, no meaningful changes are observed until about one year later. The abortion rate shows an unusual drop compared to the pre-pandemic period.

Figure 2: Changes in the TFR and abortion rate in Germany following the start of the COVID-19 pandemic



Notes: Panel A shows the monthly total fertility rate (TFR) in Germany between 2017 and 2021. Panel B shows the quarterly abortion rate per 1.000 women (age 15-49) in Germany between 2015 and 2021. We adjust for seasonality with a linear regression model including a set of month dummies (births)/quarter dummies (abortions) in the pre-pandemic period. Panel c reports estimated changes in the TFR based on the model in eq. 1; panel d reports estimated changes in the abortion rate based on the model in eq. 3 (coefficient estimates and 95% confidence interval). The gray-shaded area (panels a and b) and the dashed vertical line (panels c and d) mark the period after the start of the COVID-19 pandemic in Germany.

Source: Own illustration based on Destatis (2022a, 2022b, 2022c) and Healthcare-Datenplattform (2023).

Panel c of Figure 2 reports the main results on birth rates from our estimation model in eq. 1. To allow for a direct comparison of the underlying "pandemic" phase, we also plot the stringency index of public containment measures at the time of conception. Before November 2020, monthly changes in the TFR fluctuate randomly around pre-pandemic averages, suggesting that our empirical model successfully accounts for general trends. After the outbreak of the pandemic, we find a small though insignificant increase in the TFR in December 2020 and January 2021. From February to April 2021, there was a notable increase compared to previous periods. The peak of this increase occurred in March 2021, with a rise of 0.13 children per woman. The rise coincides with the relaxation of the first lockdown measures. Birth numbers in May and June 2021 arising from conceptions in the summer of 2020, when there were relaxed containment measures and low infection rates, show no significant differences compared to pre-pandemic periods. The TFR rises again above the pre-pandemic average between August and December 2021, arising from conceptions during the second infection wave with even stricter containment measures.

To summarize the changes in TFR following conceptions during the first 14 months of the pandemic, we estimate eq. 2, which pools the monthly COVID-estimates into one coefficient. On average, the TFR increased by 0.051 (s.e. 0.014), or about 3.3% (Table 1). This increase is comparable to Nordic countries such as Finland (Nisén et al., 2022), Sweden (Bujard & Andersson, 2024) and Norway (Lappegård et al., 2023), but it contrasts with several continental European countries (Aassve et al., 2021; Sobotka et al., 2023).

The observed increase in the TFR could be attributed to an increase in conceptions or partly to a decrease in the number of abortions. To gain a more comprehensive understanding of the birth patterns, we also examine changes in abortions. We report the results of the empirical model outlined in eq. 3 in Figure 2, panel d. Prior to the onset of the pandemic, the abortion rate fluctuates around its detrended mean. In the first year following the onset of the pandemic, we do not observe any changes in the abortion rate. However, we observe a significant decline in abortions coinciding with the second large infection wave from October 2020 to April 2021. Abortion rates significantly decreased between the first and third quarter of 2021, corresponding to a drop of 1.7-1.9 abortions per 1000 women, or about 10 percent. We note that the drop only occurs during the second lockdown. During this period, high infection numbers and infections with strong symptoms strained the healthcare system, thereby potentially limiting access to medical abortions (Gibelin et al., 2021). When we link the dynamic evolution of abortion rates to infection numbers and hospital bed occupancy, we note that abortion rates were lower during times of high hospital bed occupancy (see Appendix Figure A.2).

Could the decrease in abortions potentially explain the increase in the number of births? In theory, a decrease in abortions can be attributed to changes in the likelihood of undergoing an abortion with a given number of conceptions, or, alternatively, the number of conceptions that would have resulted in an abortion in the absence of the pandemic could have gone down (Levine, 2004). In the absence of data regarding the total number of conceptions, we cannot establish a causal link between changes in abortions and the number of births. To still quantify a hypothetical link between birth and abortion numbers, we relate changes in the number of abortions to changes in the number of births seven months later. This timeframe accounts for the remaining length of pregnancy following an average gestational age of 7.6 weeks when abortions are typically performed. The first increase in births in March 2021 does not correspond with changed abortion numbers seven months before. Yet, the increase in birth numbers in August to October 2021 coincides with a reduced number of abortions in the first quarter of 2021. Our analysis indicates a decrease of -3,010 abortions in the first quarter of 2021. Seven months later, from August to October 2021, the number of births increased by 6,967. Based on these figures, the reduction in abortion numbers may account for up to 43% of the increased number of births during that timeframe. However, it is important to note that we cannot empirically determine the factors contributing to the decline in abortions during the pandemic. Therefore, the figure we provide serves as an upper bound estimate of the potential role that reduced numbers of abortions could have played in explaining increases in the number of births in the second baby bump. It is also important to note that the potential connection between birth rates and abortions during times of crisis should not be interpreted as suggesting that politically motivated restrictions in access to abortions could result in increased birth rates.

4.2. Results for subgroups

So far, we have established the changes in births and abortions following the COVID-19 crisis at the aggregate level. We now examine the impact on different subgroups. For births, we summarize the results in Table 1 based on estimations of the regression model in eq. 2; results for abortions based on eq. 4 are summarized in Table 2.

Table 1: Summary estimates of COVID-19 effects on fertility in Germany (Nov 2020-Dec 2021)

Group/Outcome	%-change	coefficient	s.e.
Total Fertility Rate (TFR)	3.28%	0.051***	(0.014)
Overall # births/months	2.79%	1820.017***	(566.180)
ASFR below age 20	1.46%	0.111	(0.103)
ASFR age 20-24	0.66%	0.237	(0.272)
ASFR age 25-29	3.27%	2.827***	(0.871)
ASFR age 30-34	4.55%	5.160***	(1.159)
ASFR age 35-39	4.05%	2.637***	(0.725)
ASFR from age 40	-0.72%	−0.049	(0.171)
TFR unmarried	4.10%	0.037***	(0.007)
TFR married	2.54%	0.068**	(0.030)
PSFR (parity 1)	3.35%	0.026***	(0.005)
PSFR (parity 2)	2.08%	0.012*	(0.006)
PSFR (parity 3 and more)	2.34%	0.007*	(0.004)
TFR East Germany	2.48%	0.038***	(0.012)
TFR West Germany	3.97%	0.062***	(0.015)
TFR German Women	4.53%	0.065***	(0.013)
TFR Foreign Women	1.73%	0.036	(0.022)
N (months)		60	

Notes: Table reports summarized estimation results of COVID-19 on fertility in Germany between Nov 2020-Dec 2021 based on eq. 2. Each coefficient from a separate regression. Newey-West standard errors with one lag reported in parentheses. ASFR refers to the age-specific fertility rate, PSFR to the parity-specific fertility rate. * p < 0.1, ** p < 0.05, *** p < 0.01.

Source: Own calculations based on Destatis (2022a, 2022b).

Table 2: Summary estimates of COVID-19 effects on abortions in Germany (Q1 2020-Q4 2021)

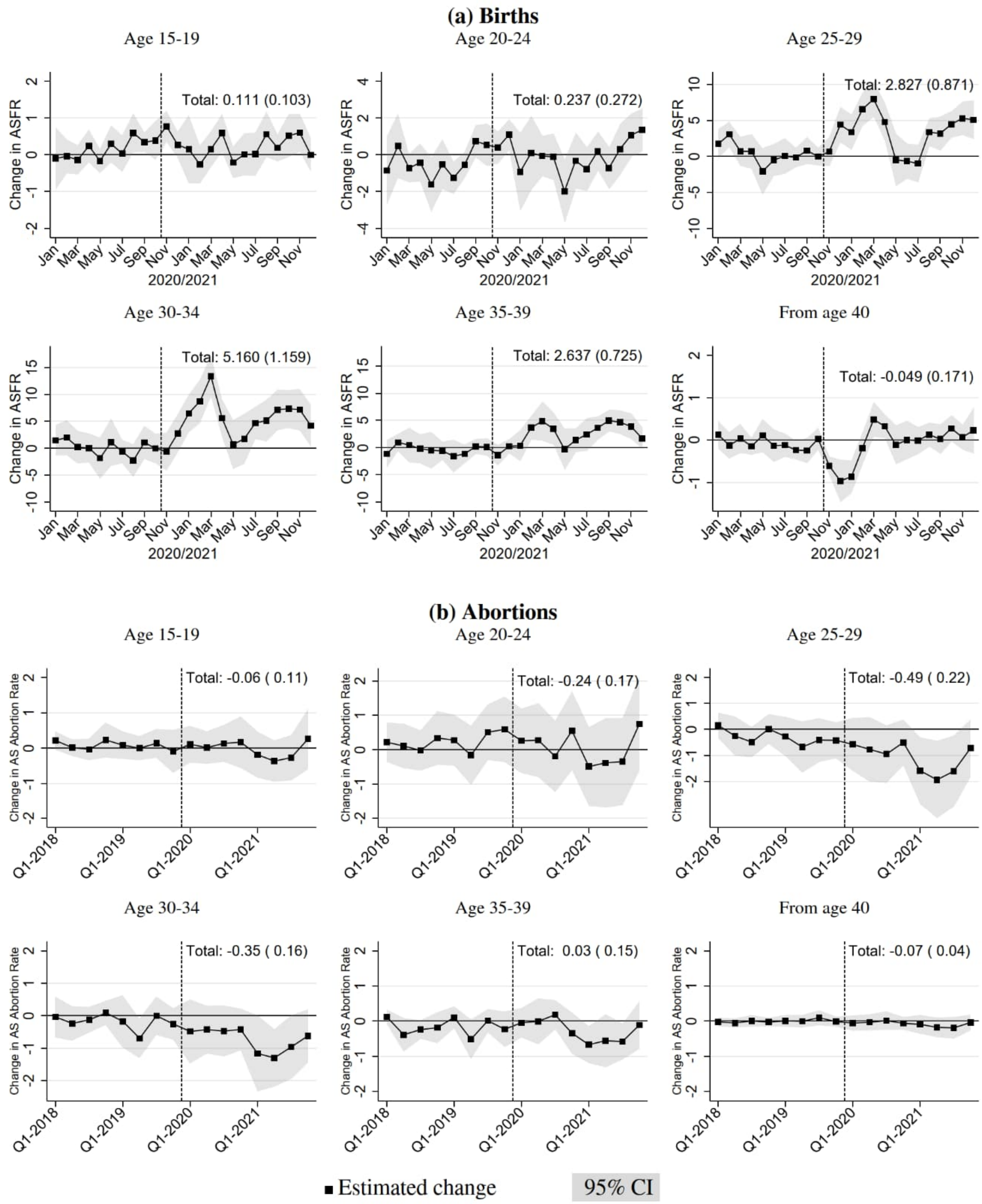
Group/Outcome	%-change	coefficient	s.e.
Abortion rate	-4.05%	−0.25*	(0.12)
# Abortions/quarter	-3.90%	−976.05**	(460.26)
Abortion rate below age 20	-1.48%	−0.06	(0.11)
Abortion rate age 20-24	-2.55%	−0.24	(0.17)
Abortion rate age 25-29	-4.99%	−0.49**	(0.22)
Abortion rate age 30-34	-3.85%	−0.35**	(0.16)
Abortion rate age 35-39	0.47%	0.03	(0.15)
Abortion rate from age 40	-4.75%	−0.07*	(0.04)
Abortions of unmarried women	-3.19%	−458.48*	(253.95)
Abortions of married women	-4.97%	−480.30*	(236.87)
Abortions without prev. children	-3.43%	−338.95	(200.01)
Abortions with one prev. child	-1.14%	−67.48	(85.69)
Abortions with two or more prev. children	-6.18%	−569.62***	(201.31)
Abortion rate West Germany	-3.26%	−0.18*	(0.09)
Abortion rate East Germany	-6.17%	−0.56**	(0.25)
Abortions following consultation	-4.05%	−975.97*	(474.02)
Abortions following criminal assault	93.65%	4.92*	(2.65)
Abortions with medical indication	-0.52%	−5.00	(26.98)
Abortions before gest. week 6	-1.86%	−175.40	(212.42)
Abortions between gest. week 7-11	-5.45%	−813.37**	(311.68)
Abortions after gest. week 11	1.81%	12.72	(34.19)
Abortion in gyn. practice	-2.36%	−465.92	(416.05)
Abortion in hospital, outpatient	-10.53%	−484.07***	(124.38)
Abortion in hospital, inpatient	-3.54%	−26.07	(36.54)
N (quarters)		28	

Notes: Table reports summary results of COVID-19 on abortions in Germany between Q1 2020-Q4 2021 based on eq. 4. The abortion rate refers to the number of abortions (scaled to annual level) per 1.000 women aged 15-49 in Germany between 2015 and 2021. Each coefficient from a separate regression. Newey-West standard errors with one lag reported in parentheses. * p < 0.1, ** p < 0.05, *** p < 0.01.

Source: Own calculations based on Destatis (2022b, 2022c).

We first investigate changes by women's age. Figure 3, Panel a, shows no significant changes in the birth rate of women below the age of 24 and a pronounced increase in the main fertile age between the ages of 25 to 39. From age 40, the changes in births are negative at the beginning of the pandemic, followed by a short and small catch-up, and they are insignificant thereafter. The age patterns of our findings largely correspond to those in Norway and Finland and to a lower level in Spain (Cozzani et al., 2022; Lappegård et al., 2023; Nisén et al., 2022). Age-specific results on abortions are reported in panel b of Figure 3. We find that the drop is most pronounced in women between the ages of 25 to 39.

Figure 3: Changes in births and abortions by women's age after the start of the COVID-19 pandemic

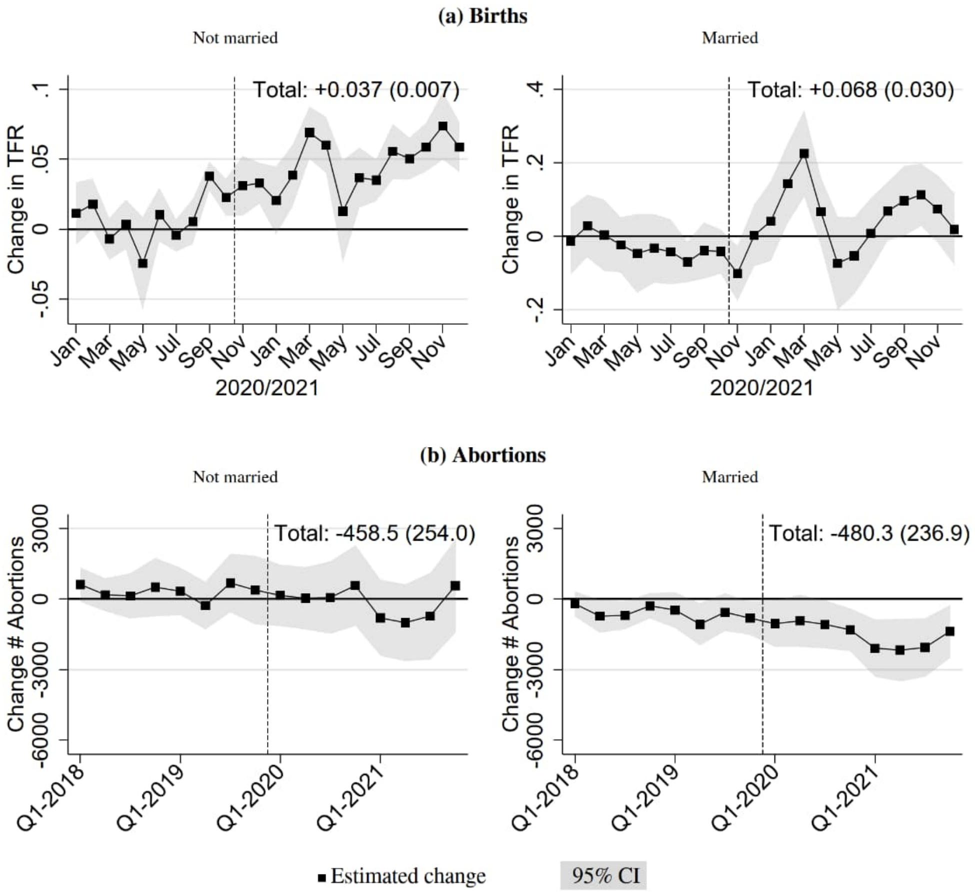


Notes: The figure plots changes in the age-specific fertility rate (ASFR, panel a) and the age-specific abortion rate (panel b) following the start of the COVID-19 pandemic in Germany. The age-specific outcomes are measures as the number of birth or abortions over the size of the respective female population in the age group. For more details, see notes to figure 2.

Source: Own illustration based on Destatis (2022a, 2022b, 2022c).

When we differentiate by marital status of women in Figure 4, births change for both unmarried and married women. However, for unmarried women, estimates in the two months prior to the pandemic are already positive and significant. The general patterns for abortions also appear similar between married and unmarried women, though they are more precisely estimated for married women (panel B of Figure 4).

Figure 4: Changes in total fertility rate by marital status after the start of COVID-19

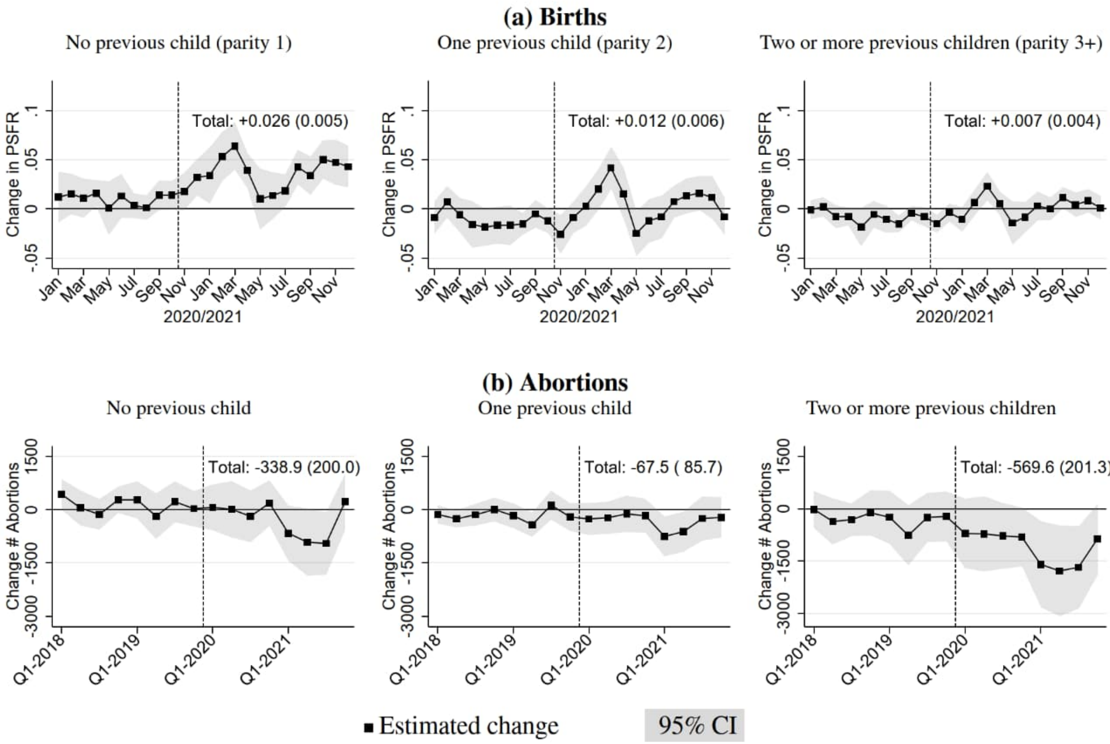


Notes: The figure plots changes in the monthly total fertility rate and the number of abortions by marital status following the start of the COVID-19 pandemic in Germany. For more details, see notes to figure 2.

Source: Own illustration based on Destatis (2022a, 2022b, 2022c).

If we examine changes by the number of previous children, we observe stronger increases for births of the first and second child (Figure 5, panel a). Other countries such as Norway or Spain show considerable differences by parity (Cozzani et al., 2022; Lappegård et al., 2023; Nisén et al., 2022). The decline in abortions in 2021 is pronounced regardless of the number of previous children (Figure 3, panel b).

Figure 5: Changes in births and abortions by number of previous children after the start of COVID-19

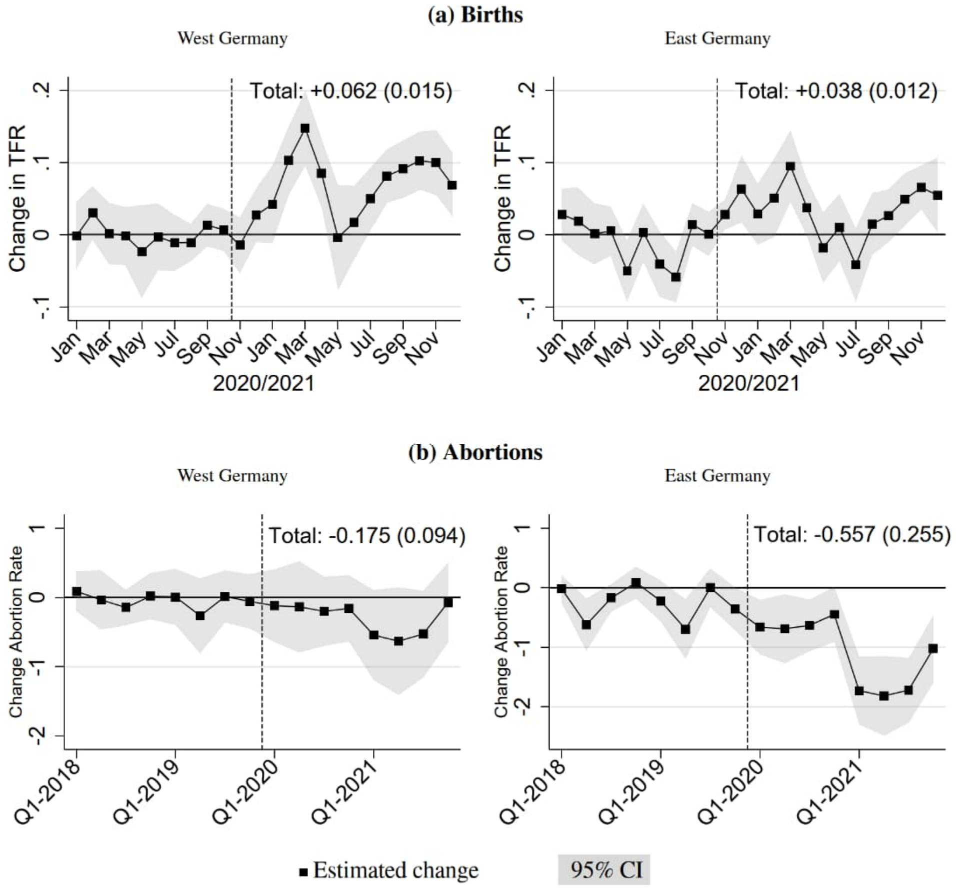


Notes: The figure plots changes in the monthly parity-specific fertility rate and in the number of abortions by the number of previous children following the start of the COVID-19 pandemic in Germany. For more details, see notes to figure 2.

Source: Own illustration based on Destatis (2022a, 2022b, 2022c).

Finally, we differentiate between East and West Germany. Both regions differ substantially in terms of gender norms, childcare infrastructure, maternal employment, and their birth trends before the pandemic (the evolution of birth rates is shown in Appendix Figure A.3). Yet, the changes in TFR during the pandemic are pronounced in both West and East Germany, though the changes are larger in West Germany (Figure 6, panel a). The COVID-19 related increase in TFR in East Germany contrasts strongly with the substantial drop in TFR that followed German reunification and that was largely attributed to the high level of economic uncertainty (Chevalier and Marie, 2017). Abortions decreased more strongly in East Germany, but the decrease was also visible in West Germany, though the statistical precision of the estimates is lower (Figure 6).

Figure 6: Changes in East and West Germany's births and abortions following the start of COVID-19



Notes: The figure plots changes in the total fertility rate (TFR) and the abortion rate in West and East Germany (including Berlin) following the start of the COVID-19 pandemic. For more details, see notes to figure 2.

Source: Own illustration based on Destatis (2022a, 2022b, 2022c).

4.3. Further results based on birth and abortion statistics

The birth and abortion statistics include additional information that is analyzed in this section. When differentiating between women with and without German nationality, we observe substantial differences in changed birth rates. For women with German nationality (Appendix Figure A.4), the TFR is above pre-COVID levels following the first two lockdowns. For women with foreign nationality, the TFR initially decreased at the onset of the pandemic, then increased after the lifting of containment measures, and is marginally significantly higher following the second lockdown.

Regarding abortions, we have additional information concerning the stated reasons for the abortion (counselling provision, medical grounds, or grounds related to a crime), the location where the abortion was performed, and the gestational week at the time of the abortion (see Appendix Figure A.5). Our findings indicate that the decline in abortions in 2021 is driven by abortions following counselling (rather than reasons classified as medical necessities or related to crime, see panels a-c), and by abortions occurring before gestational week 12 (Appendix Figure A.5, panels d-f). The decline in 2021 is largely driven by a reduction in abortions performed in gynecological practices or surgery centers, which account for 81% of all procedures in 2021 (panels g-i). Abortions carried out in hospitals on an outpatient basis, which make up 16% of all abortions in 2021, have constantly remained below pre-COVID levels since the start of the pandemic. We also observe a decrease in abortions performed in hospitals on an inpatient basis at the beginning of the pandemic, but these account for only 3% of all abortions.

5. Discussion and conclusion

In this study, we examined short-term fluctuations in birth and abortion rates during the COVID-19 pandemic in Germany using an interrupted time series approach. We offer the first in-depth analysis of official birth and abortion statistics, drawing comparisons with several pre-pandemic years. We highlight and discuss three main findings from our analysis.

First, Germany's birth rates remained stable at the end of 2020 following the onset of the pandemic. Second, in the further course of the pandemic, we observe two "baby bumps" in spring and autumn 2021, with increases of 8.8% and 6.7%, respectively. The first baby bump follows the first lockdown, the second bump coincides with the second lockdown. Third, we document a significant drop in the abortion rate during the first three quarters of 2021. This decline coincides with the second and more restrictive lockdown and corresponds to 43% of the subsequent increase in births. Overall, our results document a close connection between the course of the pandemic, the severity of public restrictions, and subsequent birth rates. The findings differ from birth trends observed in many other high-income countries (Aassve et al., 2021; Sobotka et al., 2023) and align more closely with those in the Nordic countries.

Our detailed analysis of births and abortions across various subgroups during different stages of the pandemic in Germany demonstrates that our findings apply to a wide range of socio-demographic groups. Despite economic uncertainty, restricted public life, reduced parental well-being, and increased levels of stress, birth rates increased for women aged 25-39, both married and unmarried women, and for first, second, and higher-order births. Moreover, this trend was observed in both East and West Germany, although the regions differ substantially in terms of gender norms, childcare infrastructure and maternal employment. The decrease in abortion rates was evident for women aged 25-34, both married and unmarried women, as well as for women with and without previous children. Overall, these results suggest that no single group dominates these patterns.

The "missing" drop in fertility for natives at the start of the pandemic suggests that Germany's social policies, such as extended short-time work allowances, job protection during pregnancy and parental leave, helped stabilize birth rates initially. The first baby bump then occurred immediately *after* the first lockdown was lifted. It is not associated with changes in abortion rates. For East Germany, we note that the COVID-19 related increase in fertility contrasts strongly with the substantial drop in fertility that followed the German reunification. This observation supports the argument that social policies can cushion the consequences of the crisis. Instead, we observe the first baby bump that could be attributed to a 'cocooning effect' (Bujard & Andersson, 2024). Accordingly, during times of crisis and with appropriate social policies, restrictions on public life may serve to emphasize the importance of family as a source of comfort and stability amidst widespread uncertainty. With reduced economic activity, ongoing restrictions on public life, uncertainty about the pandemic's duration, and new remote work options for many individuals, the perceived opportunity costs of having children (at an earlier stage) decreased which might contribute to explaining the pattern. On the other hand, it seems unlikely that restricted access to contraception could explain the first baby bump, as one would expect differences by age and marital status and a higher number of abortions during this period of the pandemic.

The second baby bump differs from the first one in two respects. Firstly, it is a result of conceptions *during* the second lockdown. We note that the reduced opportunity costs of having children and the cocooning effects, which likely explain the first increase, also apply to these patterns. Secondly, unlike the first baby bump, the second bump is also accompanied by a drop in the abortion rate, despite policy efforts to maintain these services. Abortions mainly decreased during periods when the healthcare system was under more strain. Moreover, the decline occurs in the same groups for which we observe the second baby bump. This rules out that a decline in unintended conceptions could explain the reduced abortion rates, as we would not expect birth rates to increase in that case. Ultimately, this does not imply that the second baby bump includes a higher number of unintended pregnancies and births. We note that decreased access to abortions due to the general health crisis could produce similar empirical findings as cocooning effects which might additionally prevent abortions in a generous welfare state in times of crises. Empirically, we cannot distinguish between the two explanations.

Despite these novel findings regarding changes in births and abortions across various subgroups in Germany, our paper has some limitations. Unfortunately, the birth and abortion statistics cannot be linked in Germany, nor can they be linked to labor market experiences, family income, or education. This linkage would allow for a more detailed investigation of potential channels. Second, we did not analyze access to contraception and prenatal care in detail, although these factors may have also affected births and abortions. Reduced access to contraception could result in more unintended pregnancies, which could contribute to increases in births (in line with our results) and abortions (contrary to our results). Future research could delve deeper into the association between socioeconomic status and reproductive health outcomes.

Yet, our analysis of birth and abortion trends still draws a nuanced picture of how the COVID-19 health crisis affected reproductive health outcomes. Notably, we show no birth decline as some other countries have, but two “baby bumps” following the first two lockdowns. We argue that active social policies can stabilize birth numbers during times of health crises and economic uncertainty, and potentially contribute to a cocooning mechanism for couples during lockdown. We also document a decline in abortions following the second lockdown during which the health system was under great tension. Overall, our findings carry important insights for other countries addressing reproductive challenges amid crises.

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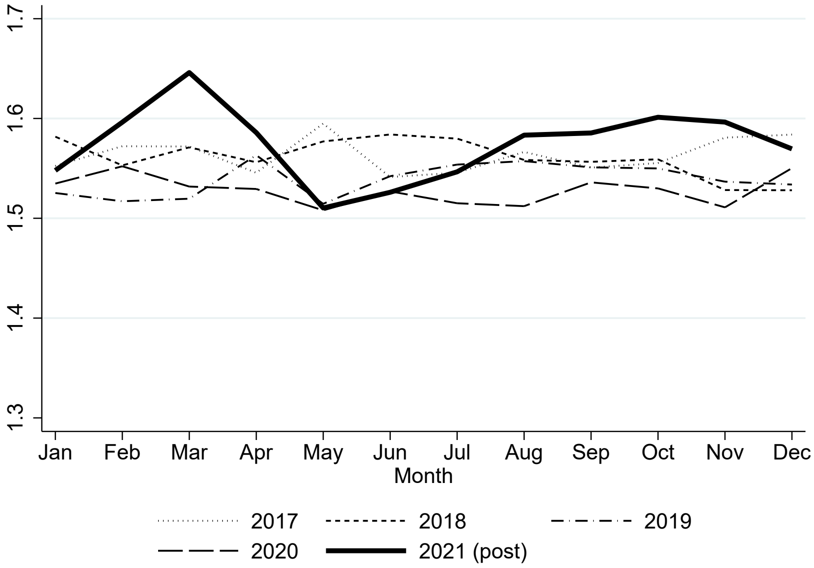
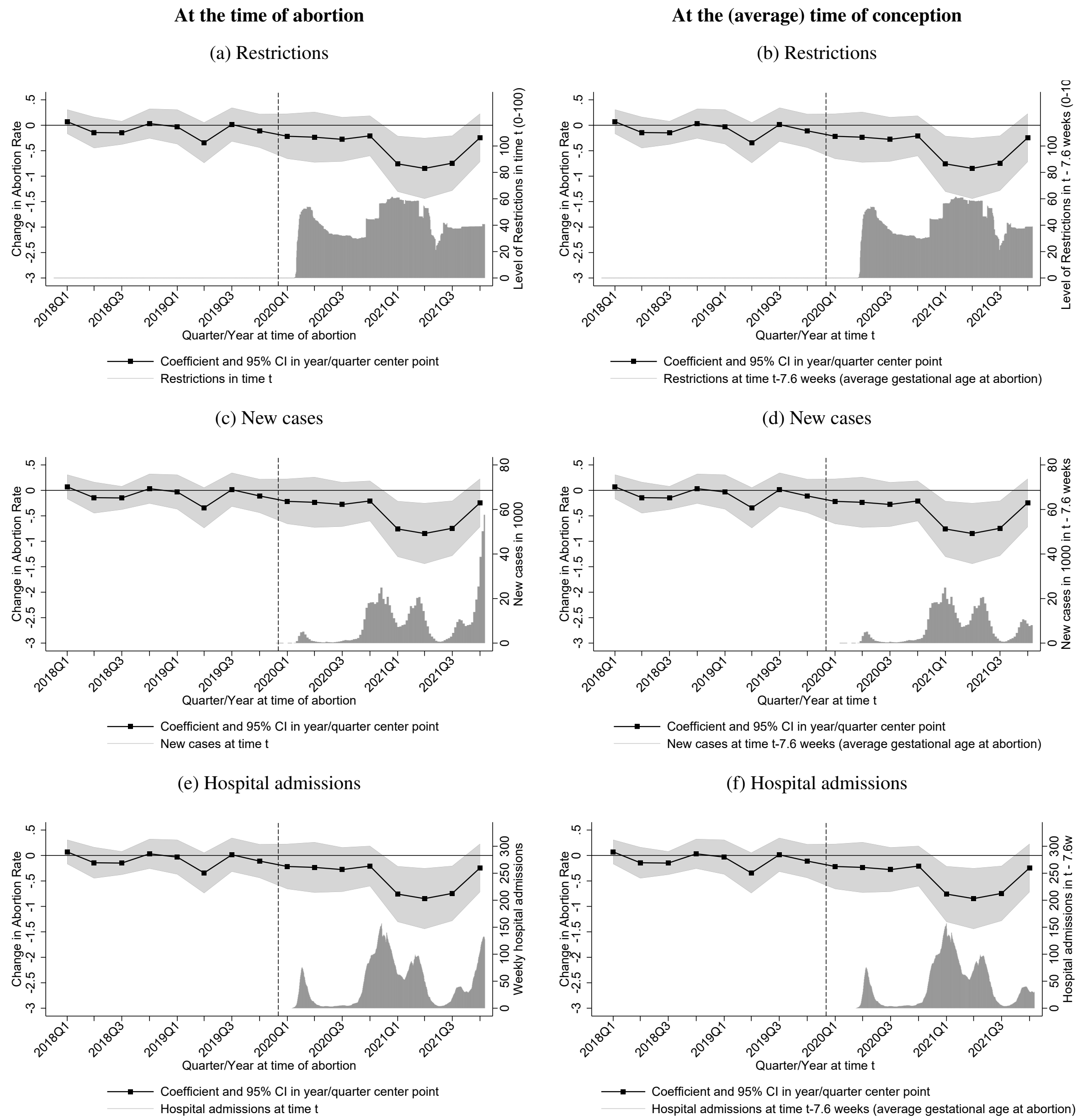
Appendix

Figure A.1: Germany's Total Fertility Rate by Year



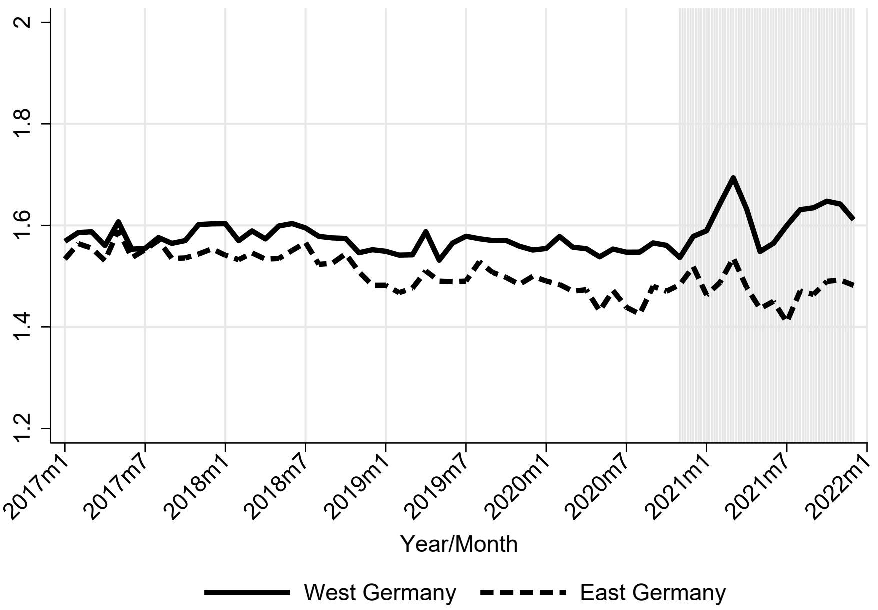
Notes: The figure shows the seasonally adjusted total fertility rate (TFR) for the years 2017 through 2021. November and December 2020 already fall in the period following the first COVID-19 infections in Germany.
Source: Own illustration based on Destatis (2022a, 2022b).

Figure A.2: Comparing changes in the abortion rate to pandemic-related indicators



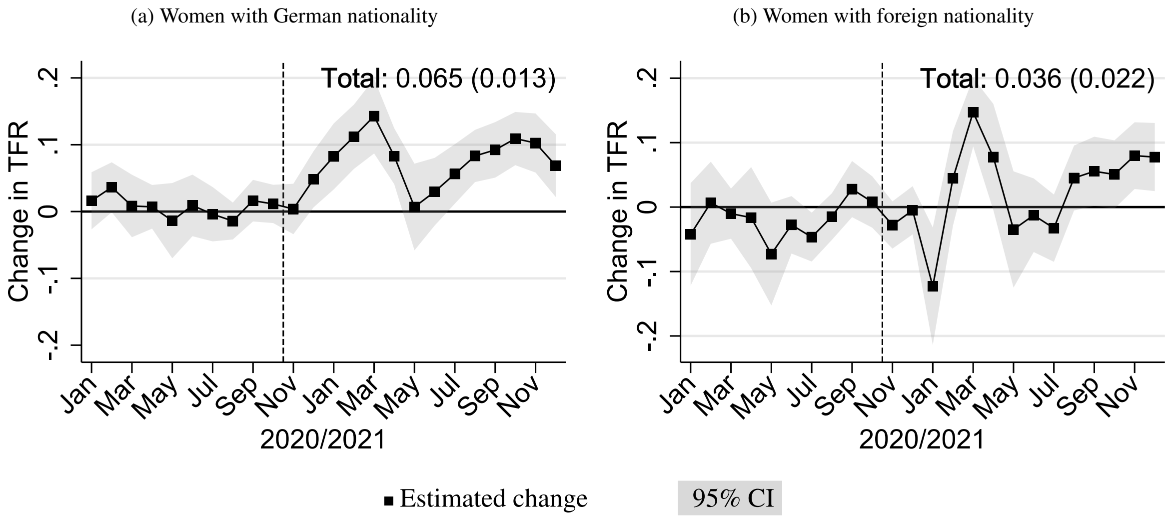
Notes: The figures plots changes in the abortion rate compared to the timing of restrictions (panels a and b), the number of new cases (panels c and d) and the number of weekly hospital admissions (panels e and f). Panels a, c and e report the pandemic-related indicators at the actual time of the abortion (centered around the middle of the quarter); panels b, d and f report the numbers at the estimated time of conception (with abortions being carried out, on average, at a gestational age of 7.6 weeks). For more details, see notes to figure 2. *Source:* Own illustration based on Destatis (2022b, 2022c) and Healthcare-Datenplattform (2023).

Figure A.3: West and East Germany's Total Fertility Rate (2017-2021, seasonally adjusted)



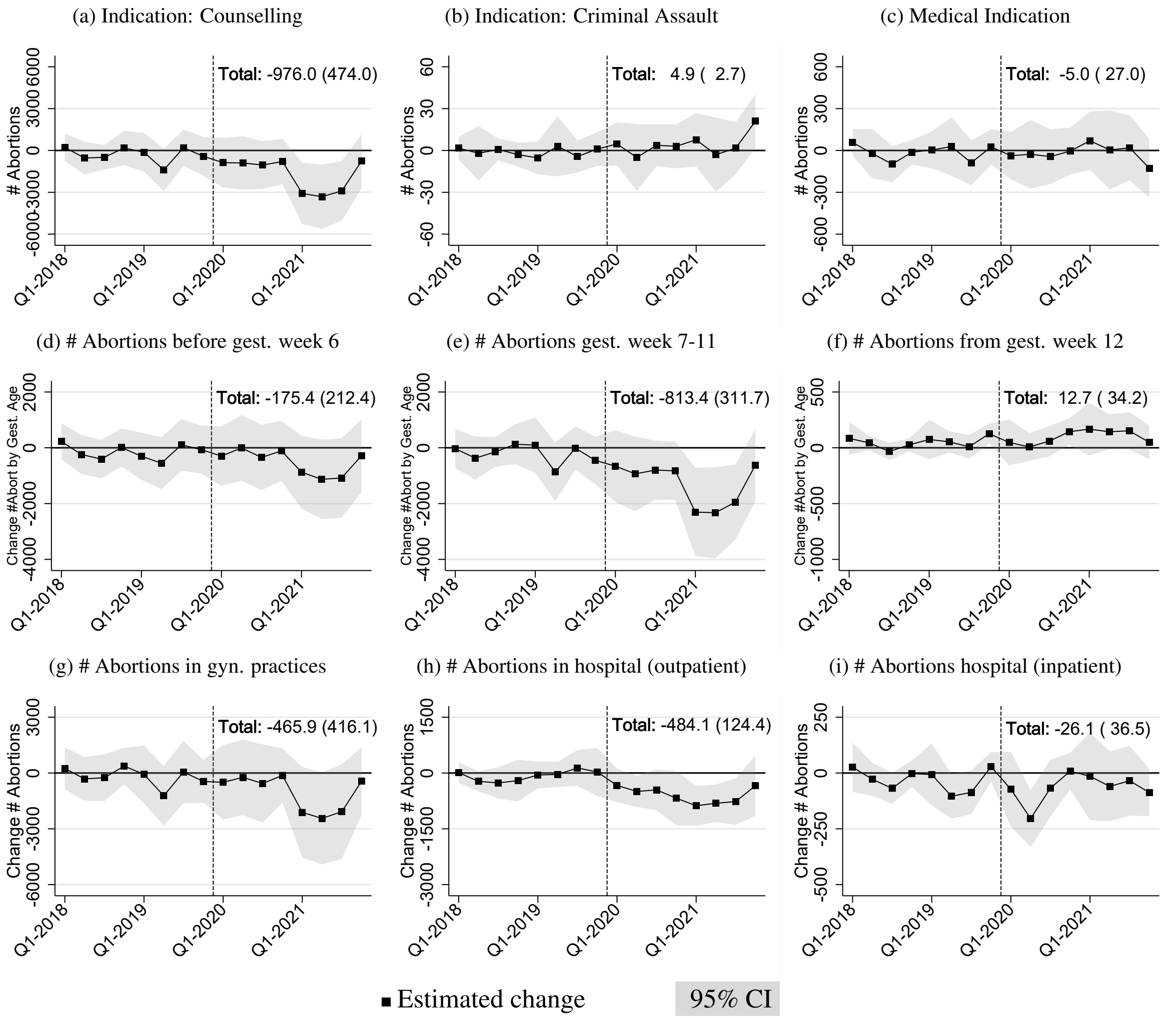
Notes: The figure plots the seasonally adjusted total fertility rate (TFR) in West and East Germany.
Source: Own illustration based on Destatis (2022a, 2022b).

Figure A.4: Changes in total fertility rate by women's nationality following the start of the COVID-19 pandemic



Notes: The figure plots changes in the total fertility rate by the nationality of women following the start of the COVID-19 pandemic in Germany. For more details, see notes to figure 2.
Source: Own illustration based on Destatis (2022a, 2022b).

Figure A.5: Changes in abortion rate following the start of the COVID-19 pandemic – further subgroup analysis



Notes: The figure plots changes in abortions following the start of the COVID-19 pandemic in Germany by indication, gestational week and the place where abortions were carried out. For more details, see notes to figure 2.

Source: Own illustration based on Destatis (2022b, 2022c).

Table A.1: Descriptive statistics for birth statistics

Outcome	Mean	*Std.Dev.*	N
Total Fertility Rate (TFR)	1.55	0.10	60
Overall # births/months	65319.17	4352.18	60
ASFR below age 20	7.30	0.87	60
ASFR age 20-24	35.26	2.65	60
ASFR age 25-29	85.99	5.77	60
ASFR age 30-34	114.18	9.51	60
ASFR age 35-39	65.59	4.51	60
ASFR from age 40	7.10	0.75	60
TFR Unmarried	0.90	0.06	60
TFR Married	2.74	0.23	60
PSFR (Parity 1)	0.78	0.05	60
PSFR (Parity 2)	0.59	0.05	60
PSFR (Parity 3 and more)	0.30	0.02	60
TFR West Germany	1.57	0.11	60
TFR East Germany	1.51	0.11	60
TFR German Women	1.45	0.11	60
TFR Foreign Women	2.07	0.11	60
Overall # births/months	65319.17	4352.18	60
# Births Mother Below Age 20	1120.88	153.55	60
# Births Mother Aged 20-24	6197.15	478.93	60
# Births Mother Aged 25-29	17075.83	1371.57	60
# Births Mother Aged 30-34	24334.85	2164.30	60
# Births Mother Aged 35-39	13648.00	993.56	60
# Births Mother Aged 40+	2933.20	246.78	60
# Births Mother Unmarried	21916.85	1381.73	60
# Births Mother Married	43402.32	3137.67	60
# Births East Germany	11644.77	896.30	60
# Births West Germany	53674.40	3597.74	60
# Births German Women	49665.05	3719.30	60
# Births Foreign Women	15654.12	725.57	60
# Births Parity 1	30363.58	1916.62	60
# Births Parity 2	23107.57	1875.02	60
# Births Parity 3 and more	11848.02	728.44	60

Notes: The table reports descriptive statistics on the main sample for fertility analyses. Each observation represents one calendar month .TFR refers to the total fertility rate of women aged 15-49, ASFR to the age-specific fertility rate, PSFR to the partity-specific fertility rate.
Source: Own calculations based on Destatis (2022a, 2022b).

Table A.2: Descriptive statistics for abortion statistics

Outcome	Mean	*Std.Dev.*	N
		(1)	
	Mean	*Std.Dev.*	N
Abortion rate	6.05	0.28	28
# Abortions/quarter	24842.50	1151.86	28
Abortion rate below age 20	3.94	0.32	28
Abortion rate age 20-24	9.29	0.56	28
Abortion rate age 25-29	9.82	0.52	28
Abortion rate age 30-34	9.16	0.37	28
Abortion rate age 35-39	7.11	0.31	28
Abortion rate from age 40	1.53	0.13	28
Abortions of unmarried women	14282.36	651.44	28
Abortions of married women	9555.11	495.85	28
Abortions without prev. children	9902.25	460.91	28
Abortions with one prev. child	5758.43	463.48	28
Abortions with two or more prev. children	9181.82	418.18	28
Abortion rate East Germany	5.39	0.25	28
Abortion rate West Germany	8.92	0.49	28
Abortions following counselling	23872.46	1136.69	28
Abortions following criminal assault	6.57	5.36	28
Abortions with medical indication	963.46	54.01	28
Abortions before gest. week 6	9632.32	567.60	28
Abortions between gest. week 7-11	14494.68	1082.95	28
Abortions after gest. week 11	715.50	50.49	28
Abortions in gyn. practice	19720.57	973.60	28
Abortions in hospital, outpatient	4381.61	410.54	28
Abortions in hospital, inpatient	740.32	48.05	28

Notes: Table reports descriptive statistics on the main sample for abortion analyses. Each observation represents one calendar quarter. The abortion rate refers to the number of abortions (scaled to annual level) per 1.000 women aged 15-49 in Germany.
Source: Own calculations based on Destatis (2022b, 2022c).