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The impact of COVID-19 on abortions in Spain

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Abstract

We study changes in abortions in Spain around the first COVID-19 lockdown. We find a large drop of 24% in the number of abortions during and shortly after the strict lockdown in spring 2020. We explore to which extent the fall was driven by fewer (unintended) pregnancies due to social isolation versus harder access to abortion services. We show that the drop was not more pronounced in areas located further away from abortion clinics, nor in locations with more COVID-19 hospitalizations. The fall in abortions was 45% larger among non-cohabiting women (relative to cohabiting women experiencing a 16% decline). We also document a 29% drop in the abortion ratio (abortions over all pregnancies) driven exclusively by non-cohabiting women. Overall, our results suggest that the main driver of the drop in abortions in Spain was a reduction in unintended pregnancies among single women during the lockdown, due to reduced social interactions.

JEL codes: J13, I12, I18

Keywords: abortion, COVID-19, lockdown, social interactions, abortion services, fertility

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1. Introduction

In early 2020, the world became unexpectedly paralyzed by the COVID-19 pandemic. Over the following 2 years, different countries were affected to a different degree, experiencing negative (and occasionally also positive) effects in various dimensions of life. Apart from morbidity and mortality, also work, schooling, mobility, and intrahousehold arrangements were affected, as well as reproductive behavior. As for the latter, the vast majority of the existing literature focuses on the impact of COVID-19 on birth rates, especially in high-income countries. Other important aspects of fertility, such as contraceptive use and abortions, have received less attention, mainly due to data availability issues.

In this paper, we focus on Spain, likely the most heavily affected country in Europe during the first wave of the COVID-19 pandemic. We estimate the impact of a strict, 2-months-long nationwide lockdown on abortion-seeking behavior of women. For identification of causal effects, we exploit the unexpected announcement and immediate implementation of the lockdown in mid-March 2020. We explore two channels through which the lockdown could have affected abortions in Spain: restrictions in social interactions, and (potentially) lower supply of health care services.

We use high-quality, population-wide administrative data on all abortions (and births) taking place in Spain in 2016-2020. We follow a difference-in-differences approach, taking into account the exact lockdown and abortion dates. First, we find evidence that the lockdown led to a dramatic, 45% drop in the number of abortions among non-cohabiting women (relative to those cohabiting with a partner). Our evidence suggests that this decrease was driven by fewer unwanted pregnancies resulting from reduced in-person contacts and lower sexual activity during the spring of 2020. As for the supply of abortion care, we do not find any effects: neither travel restrictions nor overcrowded hospitals seem to have worsened the accessibility of abortion services in Spain.

Our paper contributes to a broader literature examining the effects of the COVID-19 pandemic on reproductive behavior. Most of this literature focuses on the impact on births, mainly for high-income countries (see e.g. Aassve et al. 2021 and Sobotka et al. 2023 for multiple countries, Bailey et al. 2023 and Kearney and Levine 2023 for the US, and González and Trommlerová 2024 for Spain). In general, they find a decrease in the number of births in late 2020 and early 2021, arguably a result of fewer pregnancies conceived at the onset of the pandemic in early 2020. On the other hand, the literature focusing on changes in contraceptive use and abortions is rather scarce. As for the former, Bailey et al. (2022) document a decrease in contraceptive efficacy among low-income women in the

US. As for the abortions, one strand of literature documents cross-country comparisons of policies regulating abortion access, and how they changed during the pandemic. Bojovic et al. (2021) and Moreau et al. (2021) find that the regulatory response in Europe differed by country. In Spain, abortions were deemed essential health care, but the number of compulsory in-person visits (3-4) was not reduced (Bojovic at al. 2021). The second strand of literature estimates the effect of the COVID-19 pandemic on the number of abortions, and is most closely related to our paper. We have found only one peer-reviewed study (Marquez-Padilla and Saavedra 2022), which focuses on the capital city of Mexico, a middle-income country. They find similar decrease in elective abortions like we do (25% in Mexico City versus 24% in Spain) and moderate anticipation effects (while we find none). They attribute most of the decrease in abortions in Mexico City to restricted healthcare access (while we find no such restrictions in Spain) and only a smaller part (one tenth of the overall decrease) to lower sexual activity and fewer unwanted pregnancies among single women (while we attribute most of the effect to this channel). A study by Andersen et al. (2022) for the US finds qualitatively similar results to those in Mexico: there was a (6%) reduction in *visits* to abortion clinics in February-May 2020, which they attribute to restricted access to health care services (a ban on surgical abortions as elective surgery).

We find a large fall of 24% in the number of abortions during and shortly after the strict lockdown in Spain in spring 2020. We do not find evidence that access to abortion services was restricted during those months. Instead, our results suggest that the lockdown-driven reduction in social interactions led to a massive fall in unintended pregnancies, in turn leading to fewer pregnancy interruptions. This result complements findings in González and Trommlerová (2024) that there was a decline in conceptions during the spring lockdown, leading to fewer births in Spain in late 2020 and early 2021.

The remainder of the paper is organized as follows: In section 2, we provide background information on the COVID-19 pandemic in Spain and on COVID-19-related measures taken by the Spanish government in 2020. In section 3, we present background information on abortion regulation in Spain, and offer initial descriptive evidence on abortions. Sections 4 and 5 focus on the channels that may have affected abortions during the lockdown: social interactions and the accessibility of abortion services. The estimation methods and results are shown for each channel separately. Section 6 examines the effect on the total number of conceptions and the abortion ratio. Section 7 concludes.

2. Background on COVID-19 in Spain

The first COVID-19 cases started emerging in China in January 2020, leading to the first lockdowns as of January 23. Through international travel, COVID-19 was transmitted to Italy in February. It started spreading rapidly especially in Northern Italy, where it led to an extensive number of casualties. From there it spread to Spain, where the number of cases increased rapidly in early March. Italy was the first European country to introduce a nationwide lockdown on March 9, 2020. The Spanish government followed with similar measures several days later.

On Saturday evening, March 14, 2020, the Spanish prime minister announced that effective in 24 hours, Spain would enter a "state of alarm". The state of alarm entailed a nationwide lockdown, banning all trips that were not of absolute necessity. Residents were ordered to stay at home except for going to buy food or medicine, going to work, to the hospital, or other emergencies. While working outside of home was still allowed, those who could were asked to work from home. Lockdown restrictions also mandated a temporary closure of non-essential shops and businesses. On March 17, the Spanish government announced a support package of roughly 20% of GDP, including measures to help workers and companies affected by the lockdown. This package included the streamlining of temporary dismissal files (known as ERTEs), similar to furloughs.

By March 28, just 2 weeks after the state of alarm was announced, the Spanish government had officially banned all non-essential economic activity. After these initial moves, the state of alarm was extended repeatedly, with the confinement conditions essentially unchanged. Overall, from mid-March through early May 2020, Spain remained under the strictest lockdown in Europe.

Some easing of conditions began at the very end of April and beginning of May. Notably, on April 13, some workers in selected sectors, such as construction and manufacturing, who could not work from home but were not deemed essential sectors, were allowed to return to work. On April 26, some restrictions on personal activity were lifted, as children were able to go outside for the first time since the beginning of the confinement period, i.e. after 6 weeks of being locked indoors. Academic and school-related activities were not resumed until mid-September 2020.

On April 28, the government announced a plan to stepwise reduce the lockdown restrictions, referred to as "phases". On May 2, adults were allowed to go outside to walk and do sports following a strict time schedule. By May 11, some regions were moved to phase 1 of the de-escalation of restrictions. At this point, roughly half of the Spanish population experienced an easing of restrictions,

which allowed social gatherings of up to 10 people, while adhering to social distancing, as well as the opening of some businesses, conditional on safety measures being put in place. The state of alarm was finally lifted on June 21, 2020, after 97 days of exceptional restrictions.

To summarize the timeline and duration of the different restrictions, the strict lockdown lasted from the evening of March 15 to May 10, 2020, i.e. for 8 weeks. The state of alarm continued until June 21, 2020, i.e. another 6 weeks. After the summer, the number of COVID-19 cases started increasing again, leading to a second nationwide state of alarm which was imposed on October 25, 2020, and lasted for over 6 months. It was lifted on May 9, 2021.[1]

3. Abortions in Spain

3.1 Abortion regulation

Abortion was banned in Spain until 1985. As of August 1985, a new law made abortion legal under any of the following three reasons: 1) there was a serious risk to the physical or mental health of the pregnant woman, 2) the woman became pregnant as a result of rape (time limit 12 weeks of gestation), or 3) there was a risk of physical or mental malformations or defects in the fetus (time limit 22 weeks). In the first and third case, a medical report was required to certify compliance with those conditions, and in the second case, the rape had to be officially reported. In practice, about 98% of all abortions were filed under the "risk to the health of the pregnant woman". Many of those cases argued risks to the pregnant woman's mental health, as confirmed by a psychologist, and this was easy to argue for unwanted pregnancies.

As of July 2010, a new, more liberal law came into effect. Abortion upon request became legal up to 14 weeks of gestation. The reform was not followed by any increase in abortions. In 2011-2019, 90% of all abortions were performed upon request of the woman (in the initial 14 weeks of gestation), while 6.5% were due to a risk to the woman's life or health (up to 22 weeks of gestation), 3.2% were due to a risk of malformations in the fetus (up to 22 weeks of gestation), and 0.3% were due to existing malformations in the fetus (no time limit).

3.2 Abortion data

Our main data source are the microdata encompassing the universe of all 1,000,293 abortions registered in Spain in the years 2011-2020, made available by the Ministry of Health (MSCBS 2021).

[1] All mentioned dates fall on a Sunday.

The data set includes information on the exact date and the reason for the abortion, gestational weeks, and basic socio-demographic characteristics of the woman. The information on the exact date of each abortion allows us to implement our difference-in-differences (DiD) estimation with high accuracy.

Based on these microdata, we create a panel data set of the weekly number of abortions at the national and province level, expressed in average daily number of abortions. Our preferred specifications include women aged 15 to 44 who are residents in one of the 50 Spanish provinces. In those specifications, we exclude women aged below 15 and above 44 years (1.0% of abortions), and abortions performed on residents in the two province-cities located in North Africa (0.1% of abortions) and on non-residents (1.7% of abortions).

3.3 Descriptive evidence

Figure A1 shows the daily number of abortions performed in Spain between 2011 and 2020 to all women, and to women aged 15-44 years (hereafter referred to as women of reproductive age) and/or residents in the 50 Spanish provinces (hereafter referred to as residents). The overall trend is the same in all four groups, with only slightly different levels, reflecting the fact that 97% of abortions were performed to residents of reproductive age. In 2011-2014, there was a steep negative trend in the number of abortions, followed by a plateau in 2014-2016, and by a gradual increase in 2016-2019. We document a sharp drop in 2020, which diverges from the overall positive trend in 2016-2019 and coincides with the onset of the COVID-19 pandemic in Europe.

In Figure 1, we plot abortions by calendar month in 2018-2020. The number of abortions follows roughly the same pattern throughout the calendar year in 2018 and 2019. In January-March 2020, both the abortion level and the profile are similar to previous years, and in line with the longer-term trend. This is interrupted by an unusual, sudden, and profound drop in abortions starting in April 2020. The drop is particularly stark in May and June, followed by a partial recovery in July and August, which further continues from September onwards. Note that from April 2020 until the end of the year, the number of abortions remains lower than the corresponding levels in 2019. This means that a full "recovery" to levels expected based on the long-term trend did not take place. Instead, abortions stabilized starting in September 2020, but on a new, lower level. Overall, the drop in abortions in 2020

was an estimated 13%, but in the most affected months April-June it was 24% (while it was 22% in the broader period April-August).[2]

The sharp drop in abortions follows immediately after the onset of the COVID-19 pandemic in Spain, which happened in March 2020. In the following, we examine two possible channels through which the first wave of the COVID-19 pandemic and the corresponding lockdown could have driven the observed drop in abortions starting in April 2020.

4. Social interactions

During the 8-week long lockdown, citizens in Spain were not allowed to leave their homes except for essential reasons. Lockdown was enforced by the police, which regularly checked people in the streets and in public transport, and investigated why they had left their homes. Thus, lockdown led to a stark limitation of social interactions, which were suddenly restricted only to people living together. Arguably, this must have led to a decrease in sexual activity between people who were not residing in the same household.

4.1 Descriptive evidence

Figure 2 shows the abortion profile in 2018-2020 by women's self-reported cohabitation status at the time of the abortion. Although cohabiting women (right) do show a decrease in abortions, the decrease is relatively small and it starts only in May 2020. In contrast, non-cohabiting women (left) register a large, jump-wise decrease in abortions starting in April 2020. It is evident that the overall pattern observed in Figure 1 is driven to a large extent by non-cohabiting women. If this pattern is caused by limited social interactions, as we suspect, then the drop in abortions observed among non-cohabiting women starting in April 2020 would be the result of fewer (unplanned and unwanted) pregnancies. Had the lockdown not happened, these pregnancies would have been conceived during the lockdown period in March-May 2020, and would have been aborted later on. We refer to these conceptions as later-interrupted pregnancies hereafter. This hypothesis is visually confirmed in Figure 3, which plots number of abortions, by week of conception. Among cohabiting women (right), the decrease is gradual throughout the lockdown period, and rather small compared to non-cohabiting women (left), where the decrease is immediate, extremely steep, and extensive. In both groups, the

[2] We estimate this is a simple regression model where we use monthly data for 2016-2019 to regress the number of abortions per day on year (linearly) and month (fixed effects). Using the coefficient on year, we predict the expected level of abortions in 2020 and relate it to the actually observed value.

numbers of later-interrupted pregnancies return to higher levels once the nationwide, hard lockdown is lifted in mid-May. After the state-of-alarm period ends in late June, the numbers of later-interrupted pregnancies follow the pattern of previous years, perhaps on a slightly lower level than expected based on the positive trend in previous years.

4.2 Empirical model

In order to quantify the effect of lower sexual activity caused by limited social interactions during lockdown on abortions, we use a difference-in-differences (DiD) approach and weekly data aggregated based on the estimated date of conception.

More specifically, we compare the number of abortions (by week of conception) among non-cohabiting women ("treated") to that of cohabiting women ("control") during the lockdown period in 2020 (first difference), while controlling for the number of abortions conceived in the same calendar weeks in the previous four years 2016-2019 (second difference). The treatment period starts at the onset of the nationwide lockdown, on March 16, 2020. The equation we estimate is:

$$\log(C)_{cwy} = \alpha + \boldsymbol{\beta_1 LD_{wy} * SG_c} + \beta_2 LD_{wy} + \beta_3 SG_c + \gamma_y + \delta_w + \gamma_y * SG_c + \delta_w * SG_c + \varepsilon_{cwy} \left(+ \beta_4 SA_{wy} * SG_c + \beta_5 SA_{wy} + \beta_6 Post_{wy} * SG_c + \beta_7 Post_{wy}\right) \quad (1)$$

where the dependent variable is the logarithm of conceptions leading to an abortion **C** in calendar week **w** of year **y** in cohabitation group **c** (non-cohabiting and cohabiting women). The treatment period is determined by the week of conception **w**, and the cut-off for the start of the lockdown period **LD** is March 16, 2020.[3] The effect of lockdown on social interactions, thereby on sexual activity, and thereby on abortions, $\boldsymbol{\beta_1}$ is the coefficient of the interaction term between lockdown **LD** and a dummy variable for non-cohabiting women (referred to as single women hereafter) **SG**. Included are also dummies for lockdown **LD** and for single women **SG**, and fixed effects for year γ_y and calendar

[3] Conception week is estimated as the calendar week in which the abortion takes place, minus gestational weeks, minus 2. The calendar week variable is scaled such that March 16-22 falls into the same week in each year 2016-2020. Calendar weeks in 2020 are divided into four periods: pre-period (weeks -10 to -1; January 6 to March 15), lockdown (weeks 0 to 7; March 16 to May 10), state of alarm (weeks 8 to 13; May 11 to June 21), and post-period (weeks 14 to 20; June 22 to August 9).

week δ_w.[4] To improve precision, we interact both sets of fixed effects with the single dummy. $\boldsymbol{\alpha}$ is a constant and $\boldsymbol{\varepsilon_{cwy}}$ is the error term. Standard errors are robust.

The sample is restricted to years 2016-2020, i.e. the COVID-19 year and the four preceding years showing a positive trend in abortions. In the main specification, we include only the weeks of lockdown (8 weeks) and of the pre-lockdown period (10 weeks) in 2020, and their counterparts in 2016-2019. In an additional specification, we include also the weeks after lockdown, which comprise state-of-alarm period **SA** (6 weeks) and the post-period **Post** (7 weeks).[5]

The identifying assumption is that the only factor that caused any differences in abortion behavior between single and cohabiting women during the 2020 lockdown was the physical difficulty to be sexually active among singles. In other words, we assume that any changes in fertility intentions or in access to abortion services were similar for both single and cohabiting women throughout the period.

4.3 Results

Table 1 presents the results on the impact of limited social interactions on abortions conceived during lockdown. Each column shows the results of a different regression. First, we find that later-interrupted pregnancies decreased by 16-18% among cohabiting women during lockdown, see the first row in columns 1-3. The decrease was 42-45% larger among single women. While we cannot pinpoint the exact reason for the 16-18% decrease among cohabiting women at this point, we interpret the differential effect of 42-45% as caused by limited social interactions and the resulting decrease in sexual activity among single women during lockdown.

In columns 4-6, we expand the sample to include also the state-of-alarm period and the post-period. Among cohabiting women, both the lockdown and the state-of-alarm period led to a similarly large decrease in later-interrupted pregnancies (16-18% during lockdown, 19-21% during state of alarm). These similar magnitudes of *average levels* are explained by a gradual decrease during lockdown, followed by a gradual increase during the state of alarm (see the right panel of Figure 3). As for single women, while the differential effect is large (42-46%) during lockdown, it is only 11% during the state

[4] Note that seasonality in abortions throughout the year is non-linear. Therefore, we do not control for a polynomial in the week of conception but instead we work with week fixed effects, which allow for full flexibility.

[5] The last conception date included in the sample is August 9, 2020, because any conceptions taking place after this date could (and would) have been aborted in 2021. We cannot observe these abortions as our data end in December 2020.

of alarm. Figure 3 shows that the reason for an 11% difference in *levels* between single and cohabiting women during the state of alarm is the simple fact that abortions among single women are "returning" to their usual level from a much larger drop in the lockdown period. Nevertheless, the "reversing" trend is present in both groups. Finally, the "new" level in the post-period is by 5-8% lower than we would expect in the absence of the COVID-19 pandemic, and it does not differ between cohabiting and single women.

Finally, we explore the differences in the sexual activity channel by the size of the woman's place of residence. We distinguish between big cities (above 500,000 inhabitants) and smaller settlements. We expect that the effect of the lockdown on abortions for single women might be larger in big cities for two reasons. First, lockdown rules were likely enforced more strictly and more easily there. Second, citizens in big cities likely adhered to social distancing more diligently due to the larger risk of contagion in densely populated areas. Results in Table A1 confirm this hypothesis: the difference in abortions between single and cohabiting women is 41% in settlements below 500,000 inhabitants, versus 57% in big cities. In other words, the sexual activity channel is 16% larger in big cities compared with smaller towns.

5. Accessibility of abortion services

The first wave of the COVID-19 pandemic in Spain was truly unexpected, as the entire country was hit and paralyzed soon after Northern Italy, the first affected region in Europe. Both the pandemic and the lockdown could have arguably led to lower accessibility of abortion services, which could be driving part of the changes observed in Figure 1. On the one hand, the lockdown and the resulting limited mobility could have affected women's ability to reach an abortion clinic. On the other hand, overcrowded hospitals might have reduced the provision of certain services deemed "non-essential", and abortions might have been one of them. In the following, we test each of these potential channels separately.

5.1 Travel restrictions

Figure A2 shows two maps of Spain: one with the absolute and one with the relative availability of abortion services in each Spanish province in 2020. In 12 out of the 50 provinces (24%), there was no abortion clinic.[6] Women in these provinces have worse access to abortion, as they need to travel

[6] All of the 17 *regions* in Spain have at least one abortion clinic. Two regions have only one clinic (Extremadura and La Rioja), the median is seven, and maximum is 76 abortion clinics (Catalonia).

to another province to undergo the procedure. While traveling during lockdown was allowed for health-related reasons, many health care centers were not answering the phone. Hence, women's ability to inquire which clinic was operating and had free capacity in each particular moment may have been limited compared to pre-pandemic times. Relatedly, traveling to another province with no certainty that the woman would be admitted to the abortion clinic would have entailed a risk of wasting financial resources, which were scarcer during lockdown when many people were out of work. Finally, the need to acquire a confirmation that the travel across province lines was for health-related purposes was likely impacted by the lower response rate of health care centers, and may have acted as an additional hurdle for women to access abortion services.

5.1.1 Empirical model

We test the hypothesis that women living in provinces with no abortion clinic might have experienced lower accessibility to abortion services during the lockdown, which might have ultimately led to fewer abortions. We take a similar approach as in the previous section, using weekly data on abortions and a DiD specification. We compare the number of abortions in provinces with and without an abortion clinic (first difference) during the lockdown in 2020, while controlling for abortion levels in the same calendar weeks in years 2016-2019 (second difference). The equation we estimate is:

$$\log(A)_{pwy} = \alpha + \boldsymbol{\beta_1 LD_{wy} * NC_{p2020}} + \beta_2 LD_{wy} + \varphi_p + \gamma_y + \delta_w + \gamma_y * \varphi_p + \delta_w * \varphi_p + \varepsilon_{pwy} \left(+ \beta_3 SA_{wy} * NC_{p2020} + \beta_4 SA_{wy} + \beta_5 Post_{wy} * NC_{p2020} + \beta_6 Post_{wy}\right) \quad (2)$$

where the dependent variable is the logarithm of abortions **A** in calendar week **w** of year **y** to women residing in province **p**. The approach is essentially identical to equation (1) except that now, **w** is the week when the abortion takes place (instead of the week of conception). The effect of lockdown on accessibility of abortion services, and thereby on abortions, $\boldsymbol{\beta_1}$ is the coefficient of the interaction term between lockdown **LD** and a dummy variable **NC** indicating provinces with no abortion clinic in 2020.[7] Included are also province fixed effects $\boldsymbol{\varphi_p}$, and their interactions with week and year fixed effects, for better precision. Standard errors are clustered at the province level. In the specification

[7] Note that this variable is not included separately as it is colinear with the province fixed effects.

where we include the post-lockdown periods, the post-period **Post** spans over 27 weeks, until December 27 of each year.

The identifying assumption is that the only factor behind potentially differential abortion levels during lockdown between women living in provinces with and without an abortion clinic, was an *even more* difficult access to abortion services in provinces without a clinic *than in normal times*, and that this increased difficulty was due to travel restrictions and/or other COVID-related hurdles (lower response rate of health care centers on the phone, relatively higher financial burden of travel, etc.).

5.1.2 Results

In columns 1-3 of Table 2, we show that there was a decrease in abortions during the lockdown period by 9% to 12%, but this fall was not statistically different in provinces with no abortion clinics. The coefficient on the interaction term is large at 10-20% but it goes in the opposite direction as expected (it is positive, i.e. it hints at more abortions in provinces without an abortion clinic). When we expand the sample to include post-lockdown periods in columns 4-6, the overall qualitative result remains unchanged: none of the interaction terms is statistically significant, meaning that there was no statistically significant difference in the number of abortions in provinces with and without an abortion clinic, neither during lockdown nor afterwards. The coefficient sign during lockdown remains strikingly positive, while the signs of the interaction terms in the post-lockdown periods are negative.

Table A2 shows the results of an alternative specification where, instead of a dummy variable for the absence of abortion clinics, we use number of abortion clinics per capita (i.e. per 100,000 women of reproductive age) in the province. In this specification, we find no significant effect of the lockdown on the number of abortions in provinces with no abortion clinics (effect sizes are -4% to -7%, see columns 1-3). Moreover, we find no differential change in abortions in provinces with more abortion clinics: the effect size in a province with 1 additional clinic per 100,000 women is between 0% and 1%, and insignificant.[8]

5.2 Hospital saturation

The reason for the implementation of a nationwide, strict lockdown in Spain was the rapid, uncontrolled spread of COVID-19, which led to paralyzed, overcrowded hospitals. The health care system was saturated by COVID-19 patients, which might have led to a lower provision of other

[8] 24% of provinces have no abortion clinic. The median number of clinics per 100,000 women of reproductive age is 1.65, the 3rd quartile is 3.46, and the maximum is 11.25.

health care services. It is thus possible that access to abortion was limited as well. In order to test this hypothesis, we use data on the number of new COVID-19 cases, new COVID-19 hospitalizations, and new ICU admissions per capita.[9] Figure A3 shows the intensity of the pandemic in the 50 Spanish provinces during the second week of lockdown (March 23-29, 2020), which featured the most new cases, most new hospitalizations, and most ICU admissions during the first wave of the pandemic.

5.2.1 Empirical model

In order to test whether the COVID-19 pandemic led to fewer abortions due to an overcrowded health care system, we estimate the effect of different measures of the COVID-19 intensity on the number of abortions, using data with weekly precision. We estimate the equation:

$$\log(A)_{pwy} = \alpha + \boldsymbol{\beta_1 COVID_{pwy}} + \beta_2 LD_{wy} + \varphi_p + \gamma_y + \delta_w + \gamma_y * \varphi_p + \delta_w * \varphi_p + \varepsilon_{pwy} \left(+ \beta_3 A1_{wy} + \beta_4 BA_{wy} + \beta_5 A2_{wy} \right) \quad (3)$$

where the dependent variable is the logarithm of abortions **A** in calendar week **w** of year **y** to women residing in province **p**. The approach is similar to that of equation (2), with some changes: The effect of the COVID-19 pandemic on the availability of abortion services, and thereby on abortions, $\boldsymbol{\beta_1}$ is the coefficient of three different pandemic indicators **COVID**, measured at province level with weekly periodicity. The variable on lockdown **LD** is included separately, along with fixed effects (province, calendar week, year) and their interactions. Standard errors are clustered at province level.

In the specification where we include also post-lockdown periods, there are three of them: first state of alarm **A1** (May 11 – June 21; 6 weeks, as before), the second state of alarm **A2** (October 26 – December 27, 9 weeks), and the period between the two states of alarm **BA** (June 22 – October 25; 18 weeks). We consider the second state of alarm separately, as it was implemented due to a resurgence of COVID-19 cases and hospitalizations.

5.2.2 Results

Our main measure of the intensity of the COVID-19 pandemic with regard to hospital saturation is the number of new COVID-19 hospitalizations in the province, per capita. This variable measures possible congestion in hospitals most accurately. Table 3 shows the first set of results. In columns 1-

[9] We have data on COVID-19 deaths as well but we do not use them in the analysis, as deaths are lagged by at least one week. Hence, they do not reflect the momentary situation in the hospitals.

3, we show that in weeks and provinces with more new hospitalizations, there was no reduction in the number of abortions. If anything, the coefficient sign goes in the opposite direction. When we expand the sample to include the post-lockdown periods (columns 4-6), the coefficient of new COVID-19 hospitalizations becomes significantly *positive*. It shows that in weeks and provinces with 100 additional COVID-19 cases per 100,000 inhabitants, the number of abortions *increased* by 20%, i.e. the effect goes in the opposite direction as expected. Similar results are found when we use alternative measures of COVID-19 (new COVID-19 cases and ICU admissions per capita), see Table A3.

This counterintuitive, higher level of abortions in provinces more affected by COVID-19 may be driven by events in the post-lockdown period. We investigate this option in two ways. First, Table A4 shows the effect of different COVID-19 measures in regressions where we do not include period dummies. In the shorter sample (columns 1-3), covering January to mid-May (pre-period and lockdown in 2020), the effect is insignificant and close to zero (-0.3%). Once the sample is expanded to the entire calendar year, the effect becomes positive, large, and significant (24%). Second, Table 4 shows the effect of new COVID-19 hospitalizations on abortions in each period separately. The only period in which we find a significant effect (a positive one), is the pre-period. During lockdown, we find no significantly negative effect. In fact, we find an insignificant, positive effect (9% in the most precise specification). In the following periods, the effects remain insignificant albeit large in magnitude.

6. Total conceptions and the abortion ratio

The last piece of evidence that we provide consists of additional analyses that study the effect of the lockdown on the total number of conceptions (leading to abortion or birth) and the abortion ratio (abortions over all pregnancies). In section 4, we found evidence suggesting that the observed decrease in abortions in 2020 was driven mainly by non-cohabiting women who experienced lower sexual activity and fewer unintended pregnancies due to lockdown. In section 5, we did not find any evidence of lower availability of health care and abortion services in 2020. We now analyze the effect of the lockdown on the number of new pregnancies, as well as on the ratio of abortions to total pregnancies. We expect a decline in the number of new conceptions as a result of the restriction to social activity, and a zero or negative change in the abortion ratio.

The left panel of Figure 4 shows a substantial drop in the total number of conceptions in March-May 2020. Figure A4 reveals that this decrease is driven by both conceptions leading to an abortion

and those leading to birth. However, the magnitude of the decrease is not the same, as shown in the right panel of Figure 4. The ratio of abortions to total pregnancies decreases sharply in April and May 2020, indicating that conceptions leading to an abortion decreased at a higher rate during these two months than those leading to birth.

Next, we examine whether the observed decrease in conceptions and in the abortion ratio was driven predominantly by single versus cohabiting women, as these two groups experienced lockdown differently. We estimate the same empirical model as in Equation 1 in Section 4. Table 5 shows that there was no differential change between single and cohabiting women in terms of the number of conceptions leading to birth (insignificant effect of -0.9%, column 3).[10] This is in stark contrast to the large, 45% differential drop in later-interrupted pregnancies among non-cohabiting women that we saw in Table 1. Turning to the effect on all conceptions, i.e. those that resulted in abortion or birth (columns 4-6), we find a drop in conceptions of 16% among cohabiting women, while the fall is 11% larger among non-cohabiting women (column 6, Table 5). Note that the 11% differential effect is entirely driven by abortions.[11]

Finally, we look at the effect of the lockdown on the abortion ratio. Again, we find a negative effect, this time of -0.08 (column 9, Table 5). This corresponds to a relative effect size of 29%, given that the average abortion ratio among non-cohabiting women is 0.27. This is a more conservative interpretation, compared to relating the coefficient to the average abortion ratio in the full sample (0.22).[12] Note that the effect of the lockdown on the abortion ratio among cohabiting women is zero.

[10] Information on gestational weeks is missing for 11% of women in the 2016-2021 birth data. Information on premature birth is available for all births. In order to calculate the conception date, we impute missing gestational weeks as the median value, separately for premature (35 weeks) and non-premature (39 weeks) births.

[11] To understand the origin of the 11% differential effect in all conceptions, consider that around 22% of pregnancies result in an abortion (see the abortion ratio in the right panel of Figure 4), the effect on abortions is -45% for single relative to cohabiting women, while the differential effect on births is an insignificant -1%. A simple back-of-the-envelope calculation yields 11%. [22%*(-45%)+78%*(-1%)].

[12] Cohabitation status is missing for a large fraction of non-married women: 54% of single women, 26% of divorced or separated women, and 42% of widows in the 2016-2021 birth data. We employ three different methods for the treatment of missing values among non-married women: (1) we assume that these women are non-cohabiting, (2) we assume that they are cohabiting, and (3) we drop these observations from the sample. We estimate the models displayed in Table 5 for all three imputation methods. Our preferred method (1) yields the most conservative estimates. The coefficients with methods (2) and (3) are extremely similar to each other and their sizes are 5 times

This result further strengthens our previous interpretation of the findings in section 4, that it is lower sexual activity and thus fewer unintended pregnancies among non-cohabiting women during lockdown, which are driving the observed decrease in the number of abortions in Spain in 2020. It also strengthens the findings from our analyses in section 5 that there were no limitations in the provision of abortion services in Spain, as these would be reflected in a lower abortion ratio among both cohabiting and non-cohabiting women.

7. Discussion and conclusion

We analyze the impact of the lockdown during the first wave of COVID-19 on abortions in Spain. The number of registered abortions can be affected by supply and demand factors. Supply factors are related to the provision and accessibility of abortion services. Demand factors are broader and oftentimes intertwined: they include sexual activity, contraceptive use, and fertility intentions. We study changes in abortions in 2020 relative to previous years, and explore directly two factors potentially affecting the supply of abortion services (travel restrictions and hospitals congestion) and one factor affecting the demand (barriers to sexual activity).

Our main result is that limited social interactions caused by the nationwide lockdown in Spain in March-May 2020 led to lower sexual activity and fewer unwanted pregnancies among women who were not cohabiting with a partner. This decline resulted in fewer abortions later on. There are three additional points worth noting with regard to this finding. Firstly, pregnancies leading to an abortion fell sharply and immediately after the beginning of lockdown among non-cohabiting women, but the recovery to higher levels after the end of lockdown was only gradual (see Figure 3). There are several possible reasons for this asymmetry. First, the easing of restrictions was gradual while the lockdown was implemented immediately and to the full extent. Second, restrictions were not eased equally soon and equally fast in all regions of Spain. Finally, meeting and getting to know a new sexual partner may take some time, leading to a staggered catch up in unintended pregnancies.

Secondly, our analysis identifies the impact of limited social interactions on abortions, by comparing the number of abortions among non-cohabiting women to that of cohabiting women. Figure 3 reveals that our comparison group (cohabiting women) also experienced a gradual decline in later-interrupted pregnancies throughout the lockdown period. Our analyses show that this was likely

larger for conceptions leading to birth (corresponding to column 3, Table 5), 2 times larger for all conceptions (column 6), and 1.3 times larger for the abortion ratio (column 9) than with method (1).

not driven by lower accessibility of abortion services, i.e. by issues on the supply side. Plausible reasons lie on the demand side: fear and anxiety, (resulting in) lower sexual activity, higher contraceptive use, and/or changing fertility intentions among cohabiting women.[13] The main result of the paper – that the lockdown led to a 45% decline in abortions among non-cohabiting women (relative to those cohabiting with a partner) – is therefore only a lower-bound estimate on the total effect of the lockdown on abortions.

The third observation is that the new level of abortions in the post-period is 5% lower than we would have predicted in the absence of the COVID-19 pandemic (row 3, Table 1). Additionally, this new level does not differ between cohabiting and single women (row 7). This pattern may be driven by a general decline in (unwanted) pregnancies (caused by lower sexual activity and/or higher contraceptive use) or by a higher fraction of pregnancies conceived in the post-period that resulted in birth (changing fertility intentions).

As for the supply side, we find that travel restrictions during lockdown did not affect the ability of women from provinces with no abortion clinic to access abortion services. Note, however, that these women experience lower accessibility of abortion services even in regular times. In particular, an abortion is preceded by 3-4 in-person appointments, one of them at the abortion clinic, followed by a mandatory 3-day waiting period (Bojovic et al. 2021). Repeated travel to an abortion clinic in another province is burdensome. Thus, our results only show that the (already worse) access to abortion health care of women in provinces with no abortion clinic did not further deteriorate during lockdown.

We explore a second factor on the supply side – saturated hospitals due to the unprecedented inflow of COVID-19 patients – and find no evidence that hospital congestion limited the availability of abortion services. This is in line with Bojovic et al. (2021) who report that in Spain, abortion services were deemed essential health care and abortion clinics kept operating.

[13] Of these options, fear and anxiety seem to best explain the pattern observed in Figure 3: the decline in later-interrupted pregnancies is gradual throughout the lockdown period, followed by an equally gradual increase. This is compatible with the hypothesis of fear and anxiety that increase gradually with every extension of lockdown, and decrease once restrictions are lifted (the relief is gradual too, as is the easing of restrictions).

Most of the recent literature on fertility-related consequences of COVID-19 focuses on its impact on births in high-income countries (see e.g. Aassve et al. 2021 and Sobotka et al. 2023 for multiple countries, Bailey et al. 2023 and Kearney and Levine 2023 for the US, and González and Trommlerová 2024 for Spain). The evidence on the impact on abortions is scarcer. We found only two studies, one for Mexico (Marquez-Padilla and Saavedra 2022) and one for the US (Andersen et al. 2022). Both find a drop in the incidence of abortions after the onset of the pandemic in 2020, and both attribute it mainly to supply factors (limited availability of abortion services). Our results suggest that in case of Spain, the drop in abortions was not driven by the supply but rather by the demand side, with social distancing policies reducing the incidence of unwanted pregnancies among single women. This same demand factor also played a role in Mexico but to a much smaller extent (only 10% of the overall decline). While there were moderate anticipation effects in Mexico (additional abortions one week before lockdown), we find no such effect in Spain. Finally, the overall decrease in Spain and Mexico seems to be quite similar (around 25%), albeit caused by different factors.

In sum, we show that the strict, nationwide lockdown in Spain during the first wave of the COVID-19 pandemic (mid-March to mid-May 2020) led to fewer abortions among non-cohabiting relative to cohabiting women. The temporary but very large differential decrease of 45% was likely caused by limited social interactions of single women, which resulted in lower sexual activity and fewer unwanted pregnancies. Thus, we are able to identify one channel through which lockdown (temporarily) decreased the demand for abortions. In contrast, we do not find any evidence of negative effects on the supply side, i.e. in terms of accessibility of abortion services during the lockdown.

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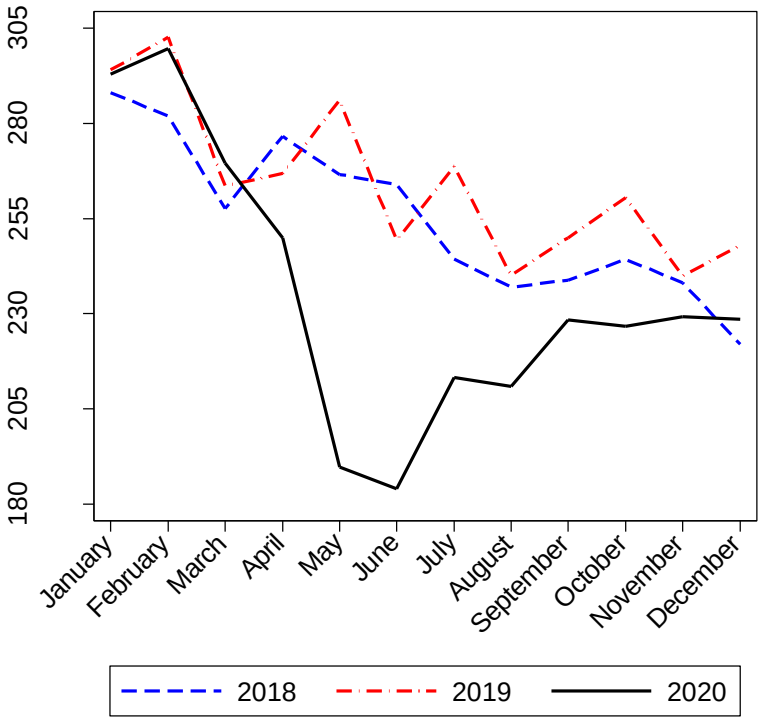
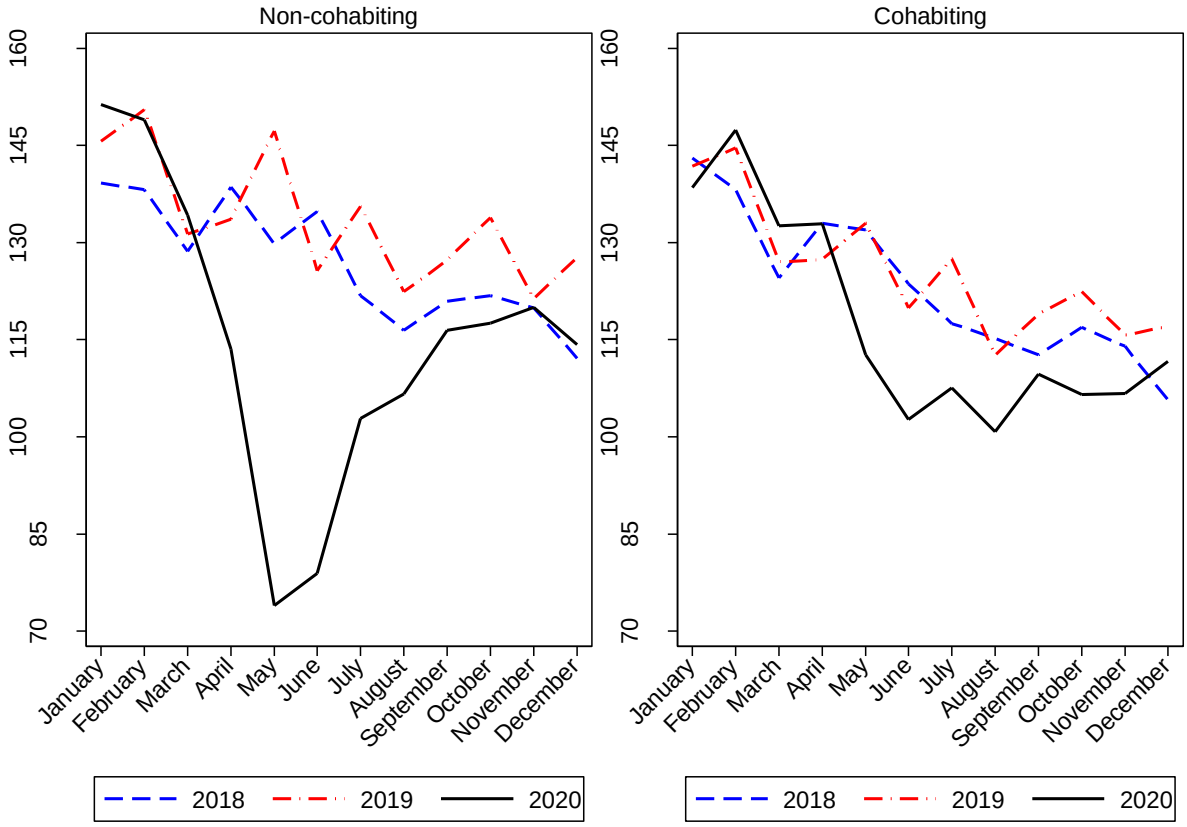
Figures

Figure 1: Number of abortions by calendar month, 2018-2020



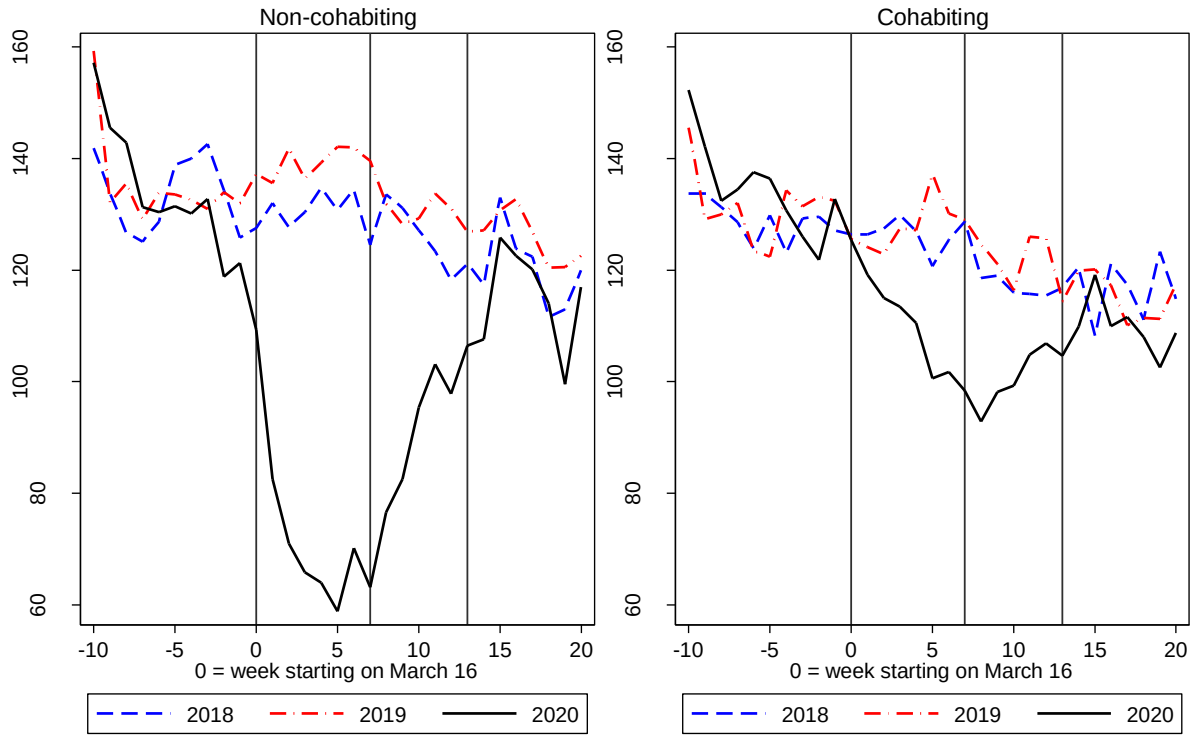
Notes: Number of abortions per day in each calendar month between January 2018 and December 2020, to women aged 15-44 years residing in the 50 Spanish provinces.

Figure 2: Monthly number of abortions by cohabitation status, 2018-2020



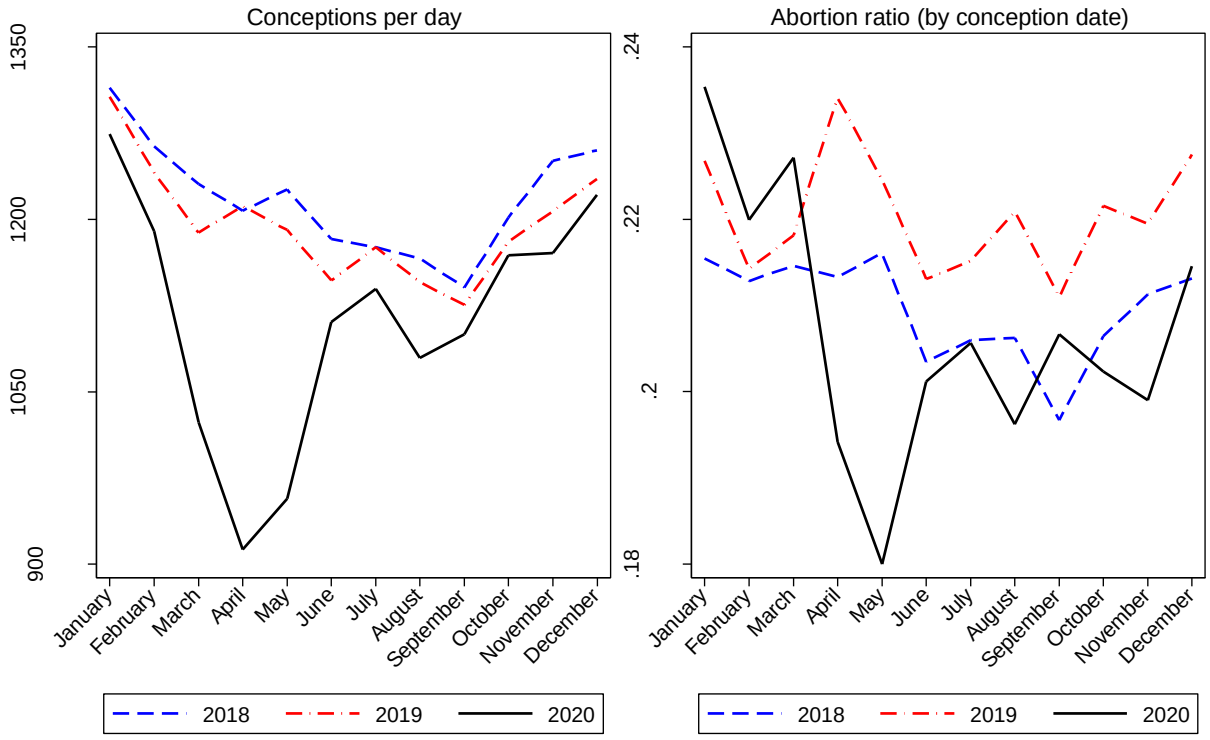
Notes: Data as in Figure 1. On the left are women who do not cohabit with any partner, on the right are women who cohabit with their partner (as reported at the time of the abortion).

Figure 3: Weekly number of conceptions that resulted in an abortion, 2018-2020



Notes: Number of conceptions per day in each week between January 6 and August 9 in 2018-2020, which were conceived by women aged 15-44 years residing in the 50 Spanish provinces, and which resulted in an abortion in gestational weeks 4-22. On the left are women who do not cohabit with any partner, on the right are women who cohabit with their partner (as reported at the time of the abortion). Conception week is calculated as: calendar week in which the abortion took place – (gestational weeks – 2). Each graph consists of four periods: pre-period (weeks -10 to -1; January 6 to March 15), lockdown (weeks 0 to 7; March 16 to May 10), state-of-alarm (weeks 8 to 13; May 11 to June 21), and post-period (weeks 14 to 20; June 22 to August 9).

Figure 4: Total number of conceptions and abortion ratio, 2018-2020



Notes: On the left is the number of conceptions per day in each calendar month, for women aged 15-44 years residing in the 50 Spanish provinces, and which resulted in abortion or birth. On the right is the abortion ratio, defined as number of conceptions in each calendar month that resulted in an abortion, over the sum of conceptions that resulted in an abortion or birth.

Tables

Table 1: Social interactions channel: The effect of the lockdown on abortions for single relative to cohabiting women

EFFECT	VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
		Only pre-period and lockdown			**All periods compared to pre-period**		
Lockdown, Cohabiting	Lockdown	-0.1653***	-0.1756***	-0.1616***	-0.1591***	-0.1756***	-0.1616***
(Mar 16 - May 10)		(0.0268)	(0.0274)	(0.0319)	(0.0270)	(0.0272)	(0.0318)
State of alarm, Cohabiting	State of alarm				-0.1900***	-0.2064***	-0.1881***
(May 11 - Jun 21)					(0.0257)	(0.0259)	(0.0303)
Post-period, Cohabiting	Post-period				-0.0591***	-0.0756***	-0.0526**
(Jun 22 - Aug 9)					(0.0168)	(0.0169)	(0.0223)
Pre-period, Diff. Single	Single	0.0154**	-0.0279**	-0.0040	0.0279***	-0.0181*	-0.0065
(Jan 6 - Mar 15)		(0.0071)	(0.0136)	(0.0290)	(0.0056)	(0.0109)	(0.0292)
Lockdown, Diff. Single	Lockdown * Single	**-0.4440*** **	**-0.4235*** **	**-0.4514*** **	**-0.4564*** **	**-0.4235*** **	**-0.4514*** **
(Mar 16 - May 10)		**(0.0658)**	**(0.0694)**	**(0.0712)**	**(0.0655)**	**(0.0689)**	**(0.0707)**
State of alarm, Diff. Single	State of alarm * Single				-0.1101*	-0.0772	-0.1138*
(May 11 - Jun 21)					(0.0576)	(0.0613)	(0.0646)
Post-period, Diff. Single	Post-period * Single				0.0170	0.0499	0.0040
(Jun 22 - Aug 9)					(0.0264)	(0.0330)	(0.0360)
	Year FE	X	X	X	X	X	X
	Week FE	X	X	X	X	X	X
	Year FE * Single		X	X		X	X
	Week FE * Single			X			X
	Observations	180	180	180	310	310	310
	R-squared	0.8578	0.8673	0.8778	0.8392	0.8510	0.8650

Notes: OLS regressions. The dependent variable is the natural logarithm of the number of conceptions in a given week that resulted in an abortion. Data are aggregated separately for cohabiting and non-cohabiting women (as reported at the time of the abortion) at national level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. Robust standard errors.

Table 2: Travel restrictions channel: The effect of the lockdown on abortions in provinces with and without an abortion clinic

EFFECT	VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
		Only pre-period and lockdown			**All periods compared to pre-period**		
Lockdown, Clinic	Lockdown	-0.0937**	-0.0935**	-0.1176***	-0.0805**	-0.0935**	-0.1176***
(Mar 16 - May 10)		(0.0382)	(0.0356)	(0.0374)	(0.0372)	(0.0350)	(0.0367)
State of alarm, Clinic	State of alarm				-0.3879***	-0.4010***	-0.3800***
(May 11 - Jun 21)					(0.0353)	(0.0356)	(0.0327)
Post-period, Clinic	Post-period				-0.1192***	-0.1323***	-0.1237***
(Jun 22 - Dec 27)					(0.0311)	(0.0278)	(0.0254)
Lockdown, Diff. No clinic	Lockdown * No clinic	**0.1002**	**0.0992**	**0.1999**	**0.0450**	**0.0992**	**0.1999**
(Mar 16 - May 10)		**(0.1186)**	**(0.1493)**	**(0.1690)**	**(0.1045)**	**(0.1465)**	**(0.1659)**
State of alarm, Diff. No clinic	State of alarm * No clinic				-0.0284	0.0258	-0.0613
(May 11 - Jun 21)					(0.0838)	(0.1224)	(0.1786)
Post-period, Diff. No clinic	Post-period * No clinic				-0.1328**	-0.0786	-0.1141
(Jun 22 - Dec 27)					(0.0598)	(0.0933)	(0.1081)
	Province FE	X	X	X	X	X	X
	Year FE	X	X	X	X	X	X
	Week FE	X	X	X	X	X	X
	Year FE * Province FE		X	X		X	X
	Week FE * Province FE			X			X
	Observations	4,500	4,500	4,500	12,750	12,750	12,750
	R-squared	0.8545	0.8598	0.8881	0.8482	0.8518	0.8834

Notes: OLS regressions. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. The reference category "pre-period" covers January 6 to March 15. Standard errors are clustered at province level.

Table 3: Hospital saturation channel: The effect of the lockdown on abortions in provinces with higher versus lower COVID-19 hospitalization rates

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Only pre-period and lockdown			**All periods compared to pre-period**		
New hospitalizations p.c.	**0.1083**	**0.0669**	**0.1072**	**0.0914**	**0.1431***	**0.1969****
	(0.0916)	**(0.0862)**	**(0.0947)**	**(0.0754)**	**(0.0810)**	**(0.0913)**
Lockdown	-0.0955**	-0.0856*	-0.0953*	-0.0915*	-0.1038**	-0.1167**
(Mar 16 - May 10)	(0.0466)	(0.0471)	(0.0520)	(0.0466)	(0.0444)	(0.0487)
Alarm 1				-0.3945***	-0.3944***	-0.3943***
(May 11 - Jun 21)				(0.0436)	(0.0439)	(0.0489)
Between Alarms				-0.1752***	-0.1783***	-0.1815***
(Jun 22 - Oct 25)				(0.0374)	(0.0372)	(0.0416)
Alarm 2				-0.1273***	-0.1348***	-0.1427***
(Oct 26 - Dec 27)				(0.0328)	(0.0325)	(0.0348)
Province FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Week FE	X	X	X	X	X	X
Year FE * Province FE		X	X		X	X
Week FE * Province FE			X			X
Observations	4,500	4,500	4,500	12,750	12,750	12,750
R-squared	0.8545	0.8598	0.8880	0.8481	0.8518	0.8833

Notes: OLS regressions. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. The reference category "pre-period" covers January 6 to March 15. New COVID-19 hospitalizations are measured at province-week level and expressed as 100 new hospitalizations per 100,000 inhabitants. Standard errors are clustered at province level.

Table 4: Hospital saturation channel, alternative specification: The effect of the lockdown on abortions by COVID-19 hospitalizations in the province, in each period separately

REGRESSIONS	Pre-period (Jan 6-Mar 15)	Lockdown (Mar 16-May 10)	Alarm 1 (May 11-Jun 21)	Between Alarms (Jun 22-Oct 25)	Alarm 2 (Oct 26-Dec 27)
New hospitalizations p.c.	0.6276**	0.1112	0.2125	0.2117	0.0442
	(0.2628)	(0.0775)	(0.9849)	(0.2004)	(0.3190)
Year FE * Province FE					
Week FE * Province FE					
New hospitalizations p.c.	0.5121*	0.0692	0.0158	0.3849	0.6973
	(0.3052)	(0.1099)	(0.8390)	(0.2434)	(0.4637)
Year FE * Province FE	X	X	X	X	X
Week FE * Province FE					
New hospitalizations p.c.	0.7272*	0.0857	-0.1369	0.3639	0.6675
	(0.3864)	(0.1297)	(0.5968)	(0.3354)	(0.5869)
Year FE * Province FE	X	X	X	X	X
Week FE * Province FE	X	X	X	X	X
Province FE	X	X	X	X	X
Year FE	X	X	X	X	X
Week FE	X	X	X	X	X
Observations	2,500	2,000	1,500	4,500	2,250

Notes: OLS regressions. Each cell shows a coefficient from a separate regression. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. New COVID-19 hospitalizations are measured at province-week level and expressed as 100 new hospitalizations per 100,000 inhabitants. Standard errors are clustered at province level.

Table 5: The effect of the lockdown on total conceptions and the abortion ratio, for single relative to cohabiting women

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Conceptions resulting in a birth			**All conceptions**			**Abortion ratio**		
Lockdown	-0.2092***	-0.1652***	-0.1643***	-0.2021***	-0.1678***	-0.1625***	0.0066	-0.0018	0.0012
	(0.0190)	(0.0169)	(0.0160)	(0.0163)	(0.0146)	(0.0144)	(0.0052)	(0.0051)	(0.0055)
Single	-0.5460***	-0.6315***	-0.6189***	-0.4159***	-0.4994***	-0.4816***	0.1013***	0.1047***	0.1082***
	(0.0066)	(0.0081)	(0.0205)	(0.0062)	(0.0079)	(0.0208)	(0.0013)	(0.0022)	(0.0046)
Lockdown * Single	**0.0810*** **	**-0.0071**	**-0.0087**	**-0.0327**	**-0.1012*** **	**-0.1117*** **	**-0.0886*** **	**-0.0718*** **	**-0.0778*** **
	(0.0182)	**(0.0218)**	**(0.0227)**	**(0.0238)**	**(0.0267)**	**(0.0268)**	**(0.0103)**	**(0.0110)**	**(0.0115)**
Year FE	X	X	X	X	X	X	X	X	X
Week FE	X	X	X	X	X	X	X	X	X
Year FE * Single		X	X		X	X		X	X
Week FE * Single			X			X			X
Observations	180	180	180	180	180	180	180	180	180
R-squared	0.9825	0.9934	0.9942	0.9749	0.9894	0.9908	0.9665	0.9704	0.9723
Average abortion ratio (all/cohab./non-coh.)							0.2190/0.1723/0.2657		

Notes: OLS regressions identical to those in Table 1 with different dependent variables. The dependent variables are: logarithm of number of conceptions in a given week that resulted in a birth (columns 1-3), logarithm of number of conceptions in a given week that resulted in a birth or an abortion (columns 4-6), and the abortion ratio, defined as number of conceptions in a given week that resulted in an abortion, over the sum of conceptions in a given week that resulted in an abortion or a birth. Included are abortions that took place in gestational weeks 4-22 and all births. Non-married women with a missing value on cohabitation status are assumed to be non-cohabiting. Robust standard errors.

Annex

Figure A1: Number of daily abortions in Spain, 2011-2020

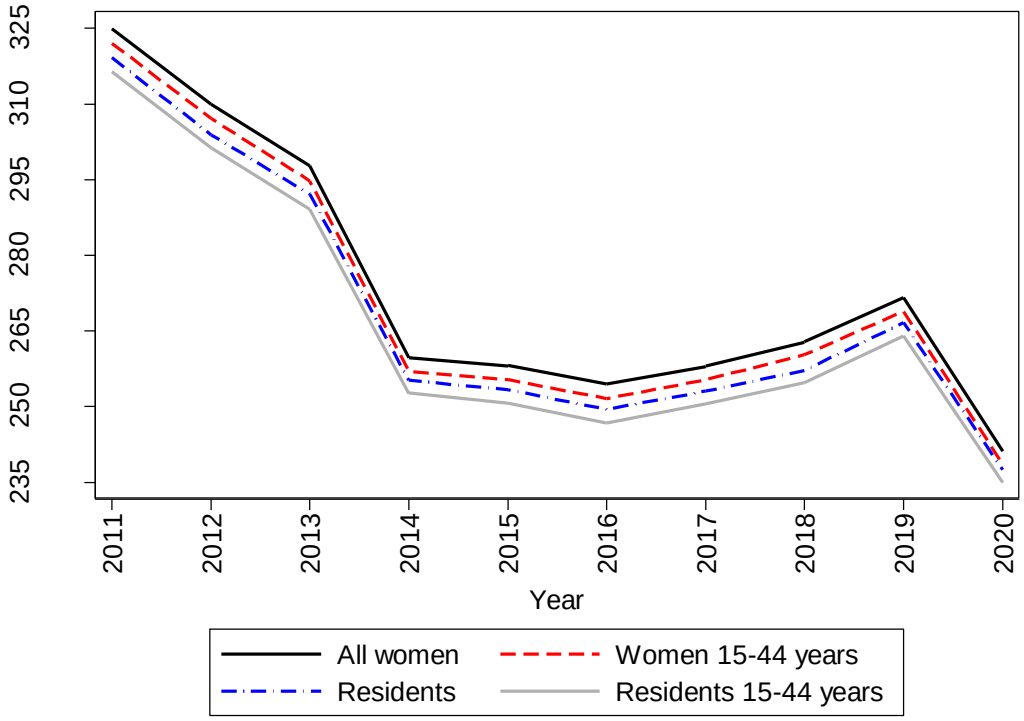
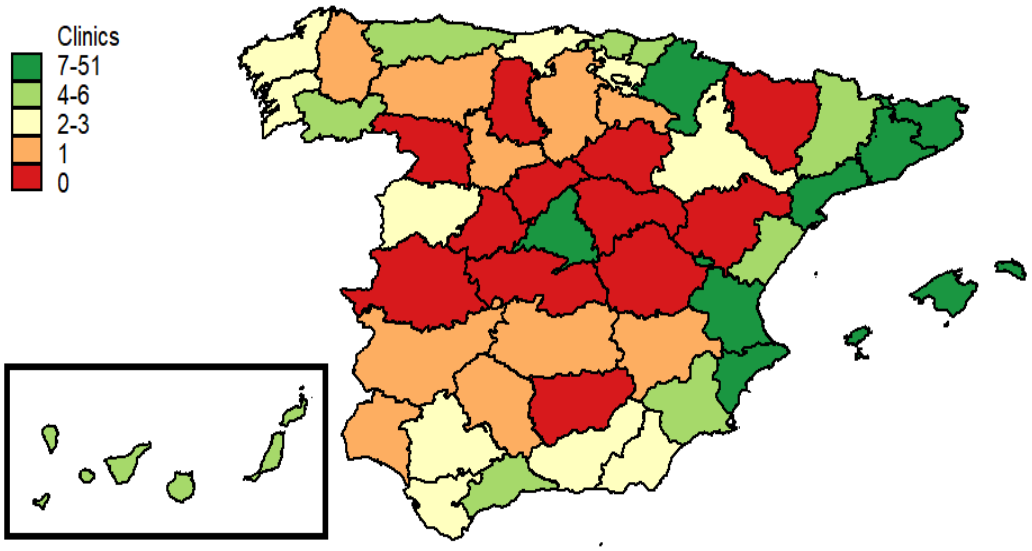


Figure A2: Number of abortion clinics in Spanish provinces in 2020

a) Number of clinics



b) Number of clinics per 100,000 women of reproductive age

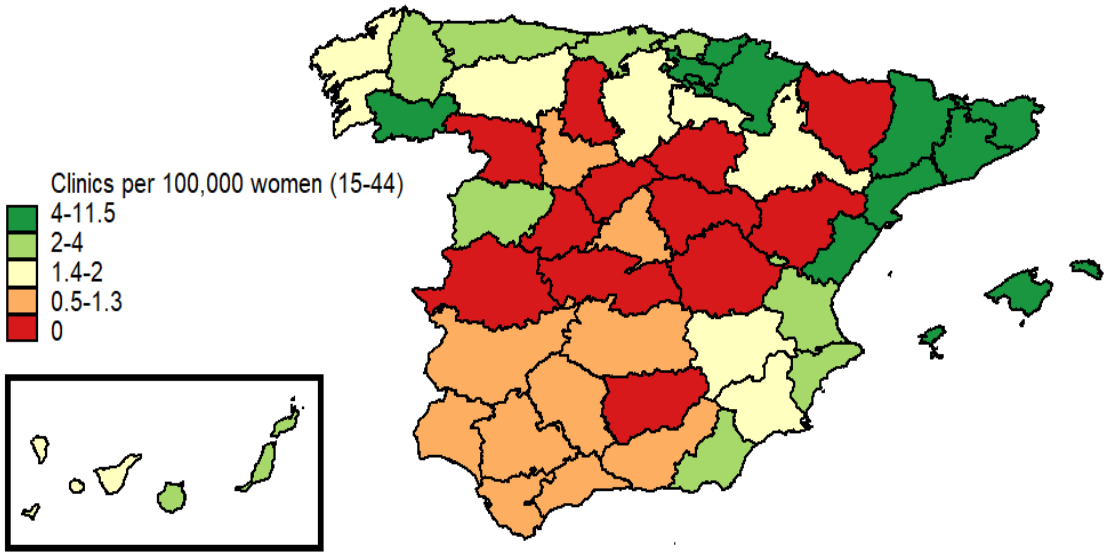
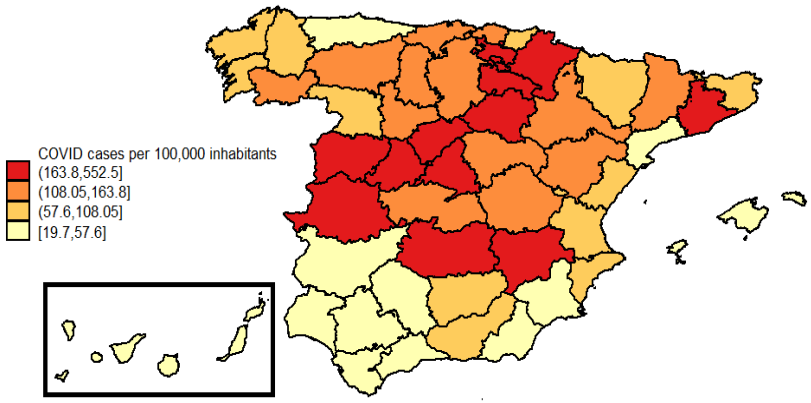
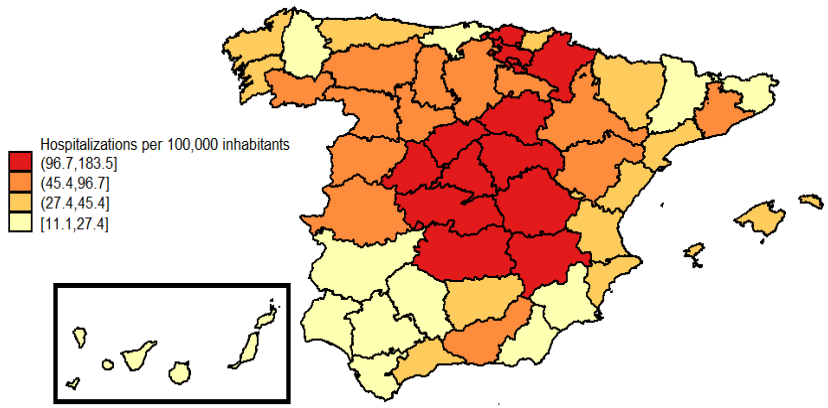


Figure A3: Intensity of the COVID-19 pandemic in Spanish provinces during the second week of lockdown (March 23-29, 2020)

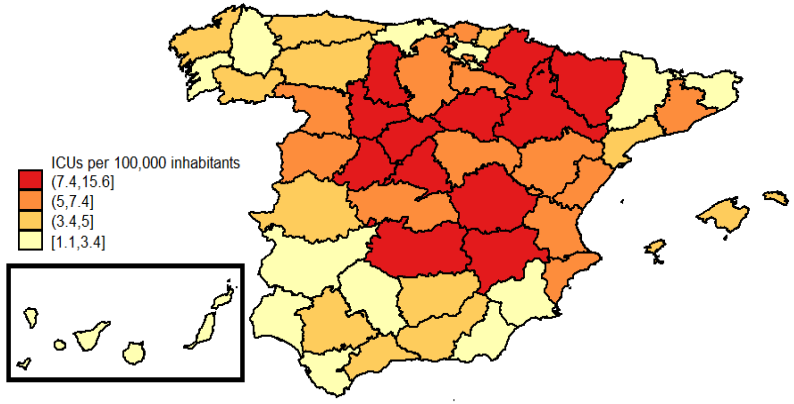
a) Number of new COVID-19 cases per 100,000 inhabitants



b) Number of new hospitalizations per 100,000 inhabitants



c) Number of ICU admissions per 100,000 inhabitants



d) Number of COVID-19 deaths per 100,000 inhabitants

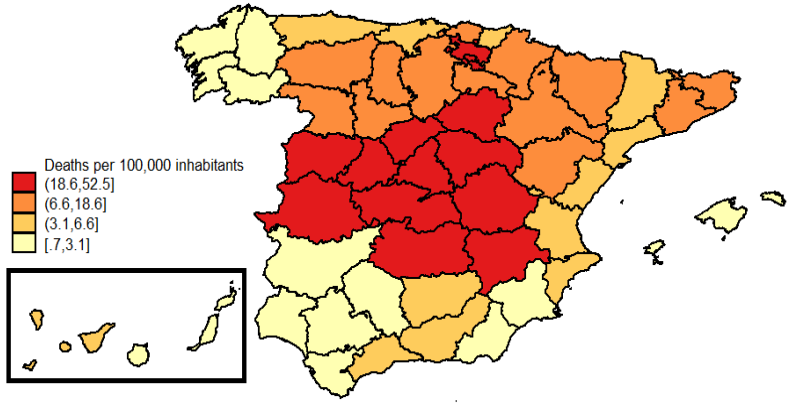
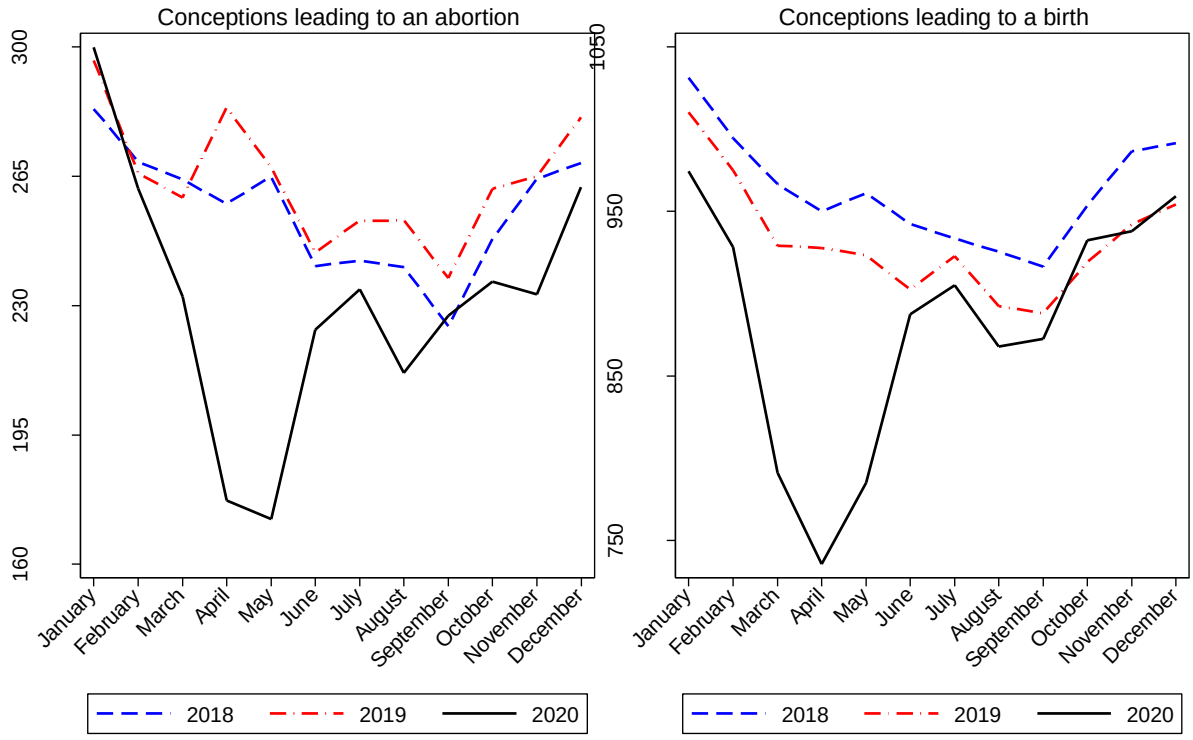


Figure A4: Monthly number of conceptions, 2018-2020



Notes: Number of conceptions per day in each calendar month, which were conceived by women aged 15-44 years residing in the 50 Spanish provinces, and which resulted in an abortion (left) or a birth (right).

Table A1: Social interactions channel by settlement size: The effect of the lockdown on abortions for single relative to cohabiting women, in settlements below and above 500,000 inhabitants

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Settlements ≤ 500,000 inhabitants			**Big cities above 500,000 inhabitants**		
Lockdown	-0.1584***	-0.1723***	-0.1549***	-0.1959***	-0.1890***	-0.1879***
	(0.0278)	(0.0288)	(0.0343)	(0.0442)	(0.0447)	(0.0498)
Single	-0.0333***	-0.0701***	-0.0683**	0.1714***	0.1034***	0.2025***
	(0.0076)	(0.0156)	(0.0282)	(0.0115)	(0.0271)	(0.0477)
Lockdown * Single	**-0.4076*** **	**-0.3799*** **	**-0.4147*** **	**-0.5588*** **	**-0.5725*** **	**-0.5747*** **
	(0.0679)	**(0.0719)**	**(0.0731)**	**(0.0709)**	**(0.0769)**	**(0.0840)**
Year FE	X	X	X	X	X	X
Week FE	X	X	X	X	X	X
Year FE * Single		X	X		X	X
Week FE * Single			X			X
Observations	180	180	180	180	180	180
R-squared	0.8345	0.8429	0.8580	0.8396	0.8494	0.8708

Notes: OLS regressions. The dependent variable is logarithm of number of conceptions in a given week that resulted in an abortion. Data are aggregated separately for cohabiting and non-cohabiting women (as reported at the time of the abortion) by settlement size (≤500,000 and >500,000 inhabitants). Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. Robust standard errors.

Table A2: Travel restrictions channel, alternative specification: The effect of the lockdown on abortions, by the number of abortion clinics per capita in the province

EFFECT	VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
		Only pre-period and lockdown			**All periods compared to pre-period**		
Lockdown, No clinic	Lockdown	-0.0690	-0.0478	-0.0409	-0.0865	-0.0478	-0.0409
(Mar 16 - May 10)		(0.0623)	(0.0708)	(0.0863)	(0.0608)	(0.0695)	(0.0847)
State of alarm, No clinic	State of alarm				-0.3930***	-0.3542***	-0.3752***
(May 11 - Jun 21)					(0.0581)	(0.0645)	(0.0840)
Post-period, No clinic	Post-period				-0.2007***	-0.1619***	-0.1845***
(Jun 22 - Dec 27)					(0.0344)	(0.0425)	(0.0532)
Lockdown, Diff. Clinics p.c.	Lockdown * Clinics p.c.	**-0.0003**	**-0.0097**	**-0.0127**	**0.0074**	**-0.0097**	**-0.0127**
(Mar 16 - May 10)		**(0.0132)**	**(0.0175)**	**(0.0249)**	**(0.0125)**	**(0.0172)**	**(0.0245)**
State of alarm, Diff. Clinics p.c.	State of alarm * Clinics p.c.				-0.0008	-0.0179	-0.0086
(May 11 - Jun 21)					(0.0082)	(0.0121)	(0.0181)
Post-period, Diff. Clinics p.c.	Post-period * Clinics p.c.				0.0218***	0.0048	0.0147
(Jun 22 - Dec 27)					(0.0073)	(0.0102)	(0.0142)
	Province FE	X	X	X	X	X	X
	Year FE	X	X	X	X	X	X
	Week FE	X	X	X	X	X	X
	Year FE * Province FE		X	X		X	X
	Week FE * Province FE			X			X
	Observations	4,500	4,500	4,500	12,750	12,750	12,750
	R-squared	0.8544	0.8598	0.8880	0.8482	0.8518	0.8833

Notes: OLS regressions. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. Clinics p.c. is the number of abortion clinics in the province per 100,000 women in reproductive age. The reference category "pre-period" covers January 6 to March 15. Standard errors are clustered at province level.

Table A3: Hospital saturation channel, alternative measures of the incidence of COVID-19: The effect of the lockdown on abortions, by new COVID-19 cases and ICU admissions

a) New COVID-19 cases

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Only pre-period and lockdown			All periods compared to pre-period		
New cases p.c.	**0.0639**	**0.0285**	**0.0208**	**0.0365****	**0.0423****	**0.0392***
	(0.0437)	**(0.0475)**	**(0.0545)**	**(0.0164)**	**(0.0178)**	**(0.0217)**
Lockdown	-0.1076**	-0.0866*	-0.0820	-0.0913**	-0.0947**	-0.0929*
(Mar 16 - May 10)	(0.0442)	(0.0455)	(0.0515)	(0.0415)	(0.0409)	(0.0471)
Alarm 1				-0.3968***	-0.3971***	-0.3969***
(May 11 - Jun 21)				(0.0439)	(0.0442)	(0.0495)
Between Alarms				-0.2062***	-0.2120***	-0.2089***
(Jun 22 - Oct 25)				(0.0408)	(0.0404)	(0.0474)
Alarm 2				-0.1826***	-0.1935***	-0.1877***
(Oct 26 - Dec 27)				(0.0383)	(0.0382)	(0.0428)
Province FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Week FE	X	X	X	X	X	X
Year FE * Province FE		X	X		X	X
Week FE * Province FE			X			X
Observations	4,500	4,500	4,500	12,750	12,750	12,750
R-squared	0.8545	0.8598	0.8880	0.8482	0.8519	0.8833

b) ICU admissions

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Only pre-period and lockdown			All periods compared to pre-period		
ICU admissions p.c.	**1.2675**	**1.1541**	**1.6177**	**1.8456****	**2.7352*****	**3.1581*****
	(0.9230)	**(0.8823)**	**(0.9957)**	**(0.7273)**	**(0.8727)**	**(0.9405)**
Lockdown	-0.0930**	-0.0909*	-0.0995*	-0.1037**	-0.1201***	-0.1278**
(Mar 16 - May 10)	(0.0445)	(0.0464)	(0.0519)	(0.0439)	(0.0432)	(0.0478)
Alarm 1				-0.3931***	-0.3923***	-0.3919***
(May 11 - Jun 21)				(0.0438)	(0.0443)	(0.0494)
Between Alarms				-0.1795***	-0.1841***	-0.1864***
(Jun 22 - Oct 25)				(0.0361)	(0.0362)	(0.0404)
Alarm 2				-0.1398***	-0.1523***	-0.1582***
(Oct 26 - Dec 27)				(0.0300)	(0.0307)	(0.0332)
Province FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Week FE	X	X	X	X	X	X
Year FE * Province FE		X	X		X	X
Week FE * Province FE			X			X
Observations	4,500	4,500	4,500	12,750	12,750	12,750
R-squared	0.8545	0.8598	0.8880	0.8481	0.8519	0.8833

Notes: OLS regressions. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. The reference category "pre-period" covers January 6 to March 15. New COVID-19 cases (ICU admissions) are measured at province-week level and expressed as 100 new cases (ICU admissions) per 100,000 inhabitants. Standard errors are clustered at province level.

Table A4: Hospital saturation channel, alternative specification: The effect of the lockdown on abortions, by different measures of COVID-19 incidence in the province

REGRESSIONS	(1)	(2)	(3)	(4)	(5)	(6)
	Only pre-period and lockdown			**All periods**		
New cases p.c.	0.0193	-0.0127	-0.0223	0.0256*	0.0288**	0.0258
	(0.0425)	(0.0457)	(0.0519)	(0.0132)	(0.0141)	(0.0172)
New hospitalizations p.c.	**0.0217**	**-0.0232**	**-0.0028**	**0.1525****	**0.1972****	**0.2423****
	(0.0850)	**(0.0844)**	**(0.0953)**	**(0.0750)**	**(0.0819)**	**(0.0953)**
ICU admissions p.c.	0.2513	0.0802	0.3554	2.4495***	3.1740***	3.5324***
	(0.9575)	(0.9183)	(1.0281)	(0.6860)	(0.8037)	(0.8971)
Province FE	X	X	X	X	X	X
Year FE	X	X	X	X	X	X
Week FE	X	X	X	X	X	X
Year FE * Province FE		X	X		X	X
Week FE * Province FE			X			X
Observations	4,500	4,500	4,500	12,750	12,750	12,750

Notes: OLS regressions. Each cell shows a coefficient from a separate regression. The dependent variable is logarithm of number of abortions in a given week. Data are aggregated at province level. Included are: women aged 15-44 years who are residents in the 50 Spanish provinces; abortions that took place in gestational weeks 4-22; years 2016-2020. New COVID-19 cases (new hospitalizations, ICU admissions, deaths) are measured at province-week level and expressed as 100 new cases (new hospitalizations, ICU admissions, deaths) per 100,000 inhabitants. Standard errors are clustered at province level.