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COVID-19 and women's health: Examining changes in mental health and fertility

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A B S T R A C T

Researchers have speculated that the economic and social consequences of COVID-19 will harm women's health. This paper tests this claim in the immediate aftermath of Mexico City's COVID-19 stay-at-home order using call-center data. We use an event-study design to track calls for fertility decisions and mental health. Our findings indicate that mental health worsened during the pandemic. Anxiety calls increased substantially, with the effect being most pronounced for those over 45. Calls related to abortion fell in number, while pregnancy calls remained stable. The abortion effect is most pronounced for women between 15 and 30 and those with a high school degree.

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1. Introduction

As a consequence of COVID-19, the International Monetary Fund estimates that the Mexican economy will contract by 10.5% in 2020, and underemployment will rise sharply throughout the year (IMF, 2020). This significant decline in real income, coupled with the evident reduction in employment, is expected to shape mental health and fertility decisions (Cunradi et al., 2011; Pan et al., 1994; Caetano et al., 2008). Researchers have speculated that the economic impact of COVID-19 and tight household quarters due to stay-at-home orders may affect marital arrangements (Brodeur et al., 2020) and fertility decisions. Further, pandemic-related social isolation is associated with heightened anxiety and depression (Hawryluck et al., 2004; Wang et al., 2020).

This paper analyzes the effect of the COVID-19 stay-at-home order on mental health and fertility decisions. We use administrative data from Línea Mujeres in Mexico City. Línea Mujeres is a public call-center service that provides legal, psychological, and medical advice to women at no charge. Using an event-study design, we track changes in call-center inquiries over nine weeks before and after the COVID-19 pandemic began in Mexico City.

Our results show two main patterns. First, mental health calls for anxiety increased, but surprisingly, depression calls are unchanged. Second, abortion-related inquiries decline, with no impact on pregnancy calls. We then examine heterogeneity by the caller's age and education. Abortion calls drop primarily for young women (15–30) and women with a high school degree. Women over 45 show the largest increase in anxiety-related calls.

We see three mechanisms that explain the observed patterns. First, unemployment may exacerbate mental health problems and influence household fertility decisions. Second, restricted healthcare access during the pandemic affects both abortion access and pregnancy decisions (Sochas et al., 2017). Third, mental health may decline during the pandemic due to lower social contact, higher stress, and increased alcohol consumption. Previous work has also shown the deleterious effects of quarantine in Toronto, Canada (Hawryluck et al., 2004), China (Wang et al., 2020), Germany (Armbruster and Klotzbucher, 2020), and the United States and nine Western European countries (Brodeur et al., 2020).
Table 1
Descriptive statistics.

|                | 2019       | 2020       |       |
|----------------|------------|------------|-------|
|                | Weeks 1–11 | Weeks 12–21| Difference |
|                | Mean       | Mean       | Est.  |
| Depression     | 0.046      | 0.046      | −0.000|
| Anxiety        | 0.253      | 0.263      | 0.010 |
| Abortion       | 0.233      | 0.229      | −0.004|
| Pregnancy      | 0.044      | 0.049      | 0.005 |
| N              | 176        | 160        | 336   |

Source: Línea Mujeres. Notes: Significance levels: * p < 0.1, ** p < 0.05, *** p < 0.01.

Fig. 1. Event Study: Main Findings. SOURCE: Línea Mujeres. NOTES: Plotted coefficients are event-study dummy variables, $\beta_t$. $\beta_t$ represents the number of weeks before and after the lockdown, excluding the period just before adoption. Solid lines show point estimates. Dashed lines display the 95% confidence intervals. Calls are measured per 100,000 inhabitants. Baseline fixed effects include the municipality, week, and year. Controls include age. Robust standard errors are clustered at the municipal level.

2. Background

The World Health Organization (CSG, 2020) officially declared COVID-19 a pandemic on March 11, 2020 (week 11). In Mexico, the majority of events occurred in the subsequent weeks. Mexico’s Education Minister announced the closure of schools on March 16 (week 12, 2020; SEP (2020)), which initiated a drop in mobility in Mexico City (Figure A.1). On March 23 (week 13), Mexico’s Council of General Health announced the official stay-at-home order (CSG, 2020). This lockdown specified the closure of formal-sector non-essential businesses and prohibited gatherings of more than 50 people (CDMX, 2020). After the lockdown began, there was a 70% decline in mobility in Mexico City (Figure A.1).1

3. Data

To estimate the effects of the COVID-19 lockdown on mental health and fertility decisions, we use administrative data from Mexico City’s Línea Mujeres. Línea Mujeres is a 24-hour government-funded call-center operating in all 16 municipalities. We consider call-center call volume per 100,000 inhabitants over January through May for 2019 and 2020 (21 weeks over two years). We classify calls into fertility decisions, including

1 The lockdown ended June 1, after the end of our data series.
pregnancy and abortion, and mental health, including anxiety and depression.

Table 1 provides descriptive statistics for mental health and fertility calls. Table 1 shows the pre-pandemic period (weeks 1–11) relative to the post-stay-at-home order period (weeks 12–21) in each year, 2019 and 2020. Showing 2019 alongside 2020 acts as a placebo test to ensure the estimates are truly changing due to pandemic-related events, rather than seasonal changes. The third column of each year, 2019 and 2020, displays the difference across the means for weeks 1–11 and weeks 12–21 of each year.

Fig. 2. Heterogeneity by Age. NOTES: See Fig. 1.
Over weeks 12–21 of 2020, calls for anxiety and pregnancy rise, but abortion calls decline (relative to 2020 weeks 1–11). Abortion calls decrease by more than 80% and anxiety calls rise by 88%. For depression, there is no statistically significant difference over weeks 12–21. In 2019, there are no significant changes in call volume, suggesting that the effect for 2020 is not driven by seasonality.

4. Empirical strategy

To estimate the effect of the COVID-19 lockdown on mental health and fertility decisions, we use a weekly event-study specification. Formally:

$$Y_{mty} = \sum_{q=-9}^{9} \beta_q \text{COVID}_{mq} + \theta X_{mty} + a_m + \gamma_t + \nu_y + \epsilon_{mty}$$  

where $Y_{mty}$ is the outcome of interest for municipality $m$ in week $t$ and year $y$. COVID$_{mq}$ represents a set of dummy variables, which equal one in each of the $q$ periods before (weeks 1–11), and after (weeks 12–21), the mobility decline.

$q$ represents the period relative to the week that mobility started to decline (week 12, or $q = 0$). We exclude period $q = -1$, or week 11, which reflects the week before mobility started to decline in Mexico City. This excluded period, $q = -1$, represents the baseline period, and includes all of 2019. $X_{mty}$ includes the age of the caller as a control.

$a_m$ are municipality-fixed effects. $\gamma_t$ and $\nu_y$ are week and year fixed-effects. Standard errors are clustered at the municipality level.

5. Results

Fig. 1 shows results from the event-study specification across the mental and fertility outcomes. The top two panels of Fig. 1 present the results for mental health. There is a sharp increase in anxiety calls from week three onwards, reflecting German findings (Armbruster and Klotzbucher, 2020). Despite the rise in inquiries for anxiety, there is no impact on depression.

The bottom-left graph of Fig. 1 shows that abortion calls drop off immediately in the first week of the mobility decline. Abortion calls start to rise back to the baseline levels beginning in week seven. The bottom-right graph indicates no consistent change in pregnancy calls.

In the Online Appendix, we successfully verify the increase in anxiety calls and the decrease in abortion calls. First, applying wild-cluster bootstrap-t procedure. Second, implementing a difference-in-differences specification. Third, excluding one municipality at a time. Fourth, using Google trends. Fifth, including population weights, adding time trends, and excluding controls. Sixth, implementing a correction for multiple hypothesis testing. All tests align with the main findings.

6. Heterogeneous effects

We next test whether the effect varies by age and education. Fig. 2 demonstrates that the most substantial reduction in...
abortion calls occurs for women between 15 and 30. The largest increase in anxiety calls comes from women over 45. For education, we split callers into those with, and without, a high school degree in Fig. 3. The most substantial reduction in abortion calls is from women with a high school degree. Anxiety calls increase, regardless of education.

7. Conclusion

This paper analyzes the effects of COVID-19 stay-at-home order on calls to a call-center for women’s mental health and fertility decisions. Our findings indicate that mental health worsened during the stay-at-home order. Anxiety sharply increased, particularly for those over 45. Reproductive health services for pregnancy remained stable, while calls related to an abortion fell in number. The decline in abortion calls is most pronounced for women between 15 and 30 and those with a high school degree.

Overall, our results help demonstrate the effects of COVID-19 on fertility decisions and mental health. Stay-at-home orders may disrupt women’s lives through increased anxiety and changes in the landscape of fertility decisions. Our findings demonstrate the validity of these concerns, suggesting that more could be done to offset the economic and psychological strain.

Appendix A. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.econlet.2021.109729.

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