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ABSTRACT

COVID-19 Surgical Abortion Restriction Did Not Reduce Visits to Abortion Clinics*

Due to COVID-19, 33 states banned elective medical procedures, and 13 of these states included surgical abortions. We collected street addresses of abortion clinics and linked them to SafeGraph's data on counts of visitors. We found a 32 percent decrease in clinics visits in February-May of 2020 compared to 2019. States that banned elective procedures saw an additional 23 percent decrease in visits. However, there was no significant additional decrease in the states that explicitly banned surgical abortions. We estimate that the decrease in foot traffic over these four months reduced abortions by 9 percent in 2020 relative to 2019.

JEL Classification: H75, I18, J13

Keywords: COVID-19, elective surgery, social distancing, abortion

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* The authors thank SafeGraph, a data company that aggregates anonymized location data from numerous applications in order to provide insights about physical places for providing data for this study. To enhance privacy, SafeGraph excludes census block group information if fewer than five devices visited an establishment in a month from a given census block group.

Introduction

The Covid-19 pandemic has infected over 6 million Americans since January 2020 and caused almost 200,000 deaths. Early in the pandemic, health authorities, governors, and other local leaders were concerned that there were shortages in key health care resources such as masks, gloves, and gowns that would increase the risk of transmission to health care providers. Policymakers were also worried about interpersonal interactions contributing to the spread of the virus, which led forty-two states to introduce measures to encourage or mandate that residents stay home. In addition to efforts to increase the supply of these resources, some states took steps to limit demand by restricting non-essential health care procedures. Thirty-three states either explicitly prohibited or actively discouraged health care providers from performing non-essential and elective procedures, including surgery.

Beyond these broad restrictions, many states explicitly targeted surgical abortion (as opposed to medical or pharmaceutical abortion, which involves only orally taken medications) as part of their COVID-19 restrictions. These states included these procedures as prohibited elective surgeries that could be reasonably deferred until after the pandemic had subsided. This is despite the obvious persistent growth of an embryo, eventually becoming a fetus that would have to be aborted through more invasive (and often banned) procedures

These temporary restrictions exist in the context of other permanent restrictions, including imposing maximum gestational age and mandatory waiting periods, requiring multiple visits, mandating detailed building codes, and insisting on providers having admitting privileges at nearby hospitals. While these other restrictions have been studied previously in the health economic literature and beyond (e.g., Slusky and Lu 2016; Packham 2017; Slusky 2017; Lu and Slusky 2019; Fischer, Royer, and White 2018; Venator and Fletcher 2019; Lindo and Pineda-

Torres 2019; Myers and Ladd 2020 Lindo, Myers, Schlosser, and Cunningham 2020), to our knowledge no one has studied COVID-19 related abortion restrictions.

We use two primary data sources: daily cellular location data from SafeGraph that counts the number of visits to outpatient healthcare providers and lists of abortion providers across the United States. These data do not distinguish between patients and employees of the health care provider nor do they identify the reason for a visit.

Our balanced panel included full data for 317 abortion providers located in 42 states and the District of Columbia, and our time period spanned February to May 2019 and 2020. Using fixed-effect Poisson regressions, we examined how abortion clinic visit volume on a given clinic-date was impacted by several variables, including the number of COVID-19 cases in the county, the year (i.e., a dummy for the COVID-19 pandemic), and restrictions on elective medical procedures, and explicit restrictions of surgical abortion.

We find that abortion clinic visits dropped by 32 percent in 2020 compared to 2019. Restrictions on elective medical procedures led to an additional statistically significant 23 percent decrease in the volume of abortion clinic visits. However, explicitly targeting surgical abortion as part of these restrictions did not have a statistically effect.

Background

In response to the COVID-19 pandemic, many states chose to enact restrictions on medical procedures to conserve the use of personal protective equipment and minimize interpersonal contact. 33 states banned elective medical procedures, and 13 of these states included surgical abortion in these bans despite the time sensitive nature of this procedure (Figure 1). The Centers

for Medicare and Medicaid Services, which directs the Medicare program, also advised health care providers to defer elective, non-essential procedures when possible.[1]

Although we do not have information on the causal relationship between policy decisions and abortions during the pandemic, there is some preliminary information from survey data. Around one third of women reported that they had reproductive health appointments delayed or cancelled during the pandemic (Guttmacher 2020). Additionally, a survey of South African clinics showed a decrease in contraceptive implant application as well as abortion care (Adelekan et al. 2020).

More broadly, there has been as much as a 40 percent decrease in non-COVID healthcare utilization during the spring of 2020 (Ziedan, Simon, and Wing 2020), not all of which can be attributed to state policies on elective healthcare. This indicates that there is a reduction in demand for healthcare due to the pandemic and it is plausible to expect that reproductive healthcare such as abortion could experience a similar decrease in demand. Still, we lack a nationwide examination of the impact of the pandemic and related restrictions on abortion care.

There has also been plenty of academic speculation and commentary on the topic. Robinson et al. (2020), for example, write that "Contraception and abortion care remain essential, and we need to work at the local, state, and federal levels on policies that preserve access to these critical services," Similar opinion pieces were published in a variety of publications including Sexual and Reproductive Health Matters (Todd-Gher and Shah 2020), The Lancet (Tran et al, 2020),, and the Journal of Law and the Biosciences (Donley et al. 2020).

[1] https://www.cms.gov/newsroom/press-releases/cms-releases-recommendations-adult-elective-surgeries-non-essential-medical-surgical-and-dental

Baird and Millar (2020) argue that the pandemic has exacerbated the recent trend of compromised abortion access in the United States. Many of the states with the strictest pre-pandemic abortion laws ended up restricting it during the pandemic. The concern over this trend is echoed by Viveiros and Bonomi's (2020) warning that the pandemic-related restrictions could increase the risk of domestic violence and restrictions to abortion or contraception access.

One proposal to maintain abortion access while minimizing interpersonal contact is increased application of at-home medication abortion. Raymond et al. (2020) write that this is a safe solution for patients. The authors lay out a treatment protocol for telemedical provision of medication abortion using remote screening based on medical history and forgoing administration of RhD immunoglobulin; they believe the latter is acceptable because of recent studies indicating Rh sensitization is unlikely after early abortions. This method also forgoes lab testing or the use of ultrasound to estimate gestational age, instead using the last menstrual period to date the pregnancy. However, the telemedicine provision of medication abortion faces many legal hurdles in the United States, as outlined by Romanis et al. (2020).

Additionally, at present, the long-term impact of COVID-19 on fetuses or neonates is unknown. Early in the pandemic (May 2020), Schwandt (2020) used differences in the mortality profile of COVID-19 and the 1918 flu to argue that COVID-19 is unlikely to have long-term adverse effects, while a fetus whose mother was infected with influenza during pregnancy had worse long-term economic outcomes compared to their siblings who did not have the same exposure (Schwandt 2018). More recent studies have documented vertical transmission (mother to fetus) of COVID-19 and an increased risk of miscarriage (Shende et al. 2020). This corroborates the findings from earlier studies (Dong et al. 2020) in Wuhan at the beginning of the pandemic. The overall impact on maternal health is still unclear. While pregnant patients did not present any

differently than other adults (Lei et al. 2020), maternal mental health could be adversely impacted by the pandemic and the response to it (Topalidou et al. 2020). Pregnant women who are SARS-CoV-2 positive are also at a significantly greater risk of hospitalization, admission to the ICU, and mechanical ventilation than women who were not pregnant (Ellington et al. 2020). Finally, regarding reproductive care, second trimester abortions can be performed on COVID-positive patients without compromising physician safety in areas with high community spread, as long as proper precautions with personal protective equipment were taken (Fang, Castano and Davis 2020).

Data

Provider-level data

We collected data on visits from SafeGraph's Weekly Patterns (v2.1) data files. These files provide weekly, daily, and hourly counts of arriving visitors to over five million locations. These data are derived from anonymized GPS data from applications on over 18 million cellular devices. While SafeGraph does not disclose the applications or other datastreams that they use, typical sources for these data include weather and shopping applications. In some cases, SafeGraph is unable to assign a GPS ping to a specific point of interest. This issue is particularly salient when multiple points of interest are in close proximity either horizontally (neighboring stores) or vertically (different levels of the same structure). As a result, our ability to identify specific points of interest is somewhat attenuated and this is reflected in the set of clinics that we are able to identify.

The size of the SafeGraph panel of devices evolves over time as individuals install and remove apps from their phones and because immobile devices do not provide GPS pings. These issues are relevant for some analyses, such as assessing compliance with mobility restrictions (e.g.

Allcott et al. 2020). However, only changes in apps are relevant to our study since the devices in our study are, by definition, mobile. In conversations with SafeGraph engineers there appears to have been relatively little "app-churn" in their sample over this time period, so we do not make any adjustments to our visitor counts for changes in the number of devices in the panel over time. Furthermore, because the adjustment involves multiplying by a fixed constant for each date, the adjustment would be absorbed by the date fixed effects in our analyses.

We also collected the names and street addresses of abortion clinics listed on several publicly available online aggregators: Planned Parenthood, NARAL, and Abortion Clinics Online.[2] Our first attempt to match these with Safegraph locations was to fuzzy match (with Stata command reclink) by address and then by name; this allowed us to identify several hundred matches between our list and Safegraph's outpatient center location database. Additionally, we geocoded the clinics to facilitate Vincenty calculations (via Stata command geonear) of the distances between our clinics and the Safegraph locations. This process uncovered several matches that were not found in either round of the fuzzy matching process. Geocoding the clinics also enabled us to map the clinics as shown in Figure 1. The clinics we could not match with either method were excluded from our analysis, since we lacked any of Safegraph's visit data for those locations. This required us to drop several states from our analysis as mentioned previously.

Policy Data

We gathered data on elective procedure and surgical abortion bans from the COVID State Policy Database (Raifman et al 2020) and the Kaiser Family Foundation (Sobel et al. 2020).[3] Several states listed exceptions to these bans; for example, in Iowa, abortions were permitted if

[2] https://www.plannedparenthood.org/abortion-access, https://prochoice.org/patients/find-a-provider/, https://www.abortionclinics.com/

[3] Please see Appendix Table 3 for list of implementation dates for each state policy.

delaying an abortion until the relevant executive order had expired would mean a pregnancy exceeded Iowa's existing gestational age limit (Mehaffey 2020). Similarly, a federal judge ruled that abortion providers could determine a surgical abortion necessary on an individual basis, including if delaying the procedure would push the pregnancy past viability (Borchardt 2020.)

States varied in how strictly they enforced surgical abortion bans. In Iowa, for example, enforcement was relatively lax. Texas, on the other hand, went as far as including medication abortion in its elective procedure restrictions (Najmabadi 2020.) Although Indiana's governor stated in a press conference that surgical abortions should not continue unless medically necessary for maternal health, providers in Indiana indicated to a newspaper that they did not stop providing abortions and had not faced interference from the state (Cook and Sikitch 2020.) The ACLU of Alaska made similar comments regarding their state's own de jure abortion ban (Carter 2020.) Meanwhile, Louisiana's attorney general attempted to inspect a Shreveport abortion clinic to determine if they had performed non-medically necessary abortions (Westwood 2020.) Additionally, while other states enacted de jure bans on abortion by classifying it as an elective surgery, South Dakota's travel quarantine guidelines made it infeasible for medical providers to come to the state's sole clinic to perform abortions. This led to a de facto abortion ban because the clinic does not employ any doctors who reside inside the state borders (McCammon 2020).

At least two states attempted or discussed surgical abortion bans that never came to fruition. Kentucky's state legislature passed a bill that would have restricted abortion as part of the pandemic response, but it was vetoed by Governor Andy Beshear (Sobel et al. 2020.) Utah's legislature discussed a surgical abortion ban, but the measure never came to a vote (Keating et al. 2020.) Therefore, neither of these states are included in our count of those that banned surgical abortion at some point during the pandemic. We did not attempt to index differences in surgical

abortion policy for our analysis, but it is important to note that these restrictions were not entirely consistent from state to state.

We also used a variety of sources, mostly local newspapers, to identify which states attempted to ban surgical abortion as part of their emergency response to the pandemic. We also made use of a crowdsourced collection of state pandemic responses to identify if and when a state restricted elective medical procedures. We coded our two dummy variables to turn on the day a state enacted an order banning elective procedures (and surgical abortion, when it was included in these orders.) They turned back off when the relevant order expired or was halted by a court decision, which occurred in a few cases. If the court order was appealed and overturned, the variable turned back on. Although we found several instances of court orders requiring abortions be allowed to continue, we did not find information about this occurring for general elective procedure bans. Therefore, the indicator for surgical abortion bans turned on and off intermittently for some states whereas the indicator for elective surgery bans turned on and then off once per state. Finally, we used data from Johns Hopkins University (Center for Systems Science and Engineering 2020) for the count of COVID-19 cases in each county.

Methods

Using a balanced panel of abortion clinics, we estimated fixed effect Poisson regressions to examine the impact of state policies on visits to abortion clinics during the pandemic.

$$ClinicVisits_{csdwy} = f(\alpha + \beta year_y + \gamma ElectiveProcedureBan_{sdwy} + SurgicalAbortionBan_{sdwy} + \mathbf{X}_{csdwy} + \mathbf{clinic}_c + \mathbf{dayweek}_{dw} + \varepsilon_{cst})$$

where *ClinicVisits* is the volume of clinic visits for clinic *c* in state *s* on day *d* (e.g., Monday) of week *w* (e.g., week 10 of the year) and year *y* (e.g., 2020).

We created two dummy variables for state restrictions on elective medical procedures. One dummy (*ElectiveProcedureBan*) indicated if a state restricted elective medical procedures in general, while the second (*SurgicalAbortionBan*) indicated if a state defined surgical abortions as an elective procedure that ought to be canceled or postponed. To our knowledge, there were no instances of a state banning surgical abortion without banning elective medical procedures in general.

In **X**, we also incorporated a control for public holidays such as Memorial Day and President's Day, allowing us to control for decreased traffic on those clinic-dates. The final controls had to do with the prevalence of COVID-19 in the county each clinic is located in. We tested several COVID-19-related parameters, including the raw number of cumulative cases, new cases on a given clinic-date, cumulative cases per 100 thousand, and new cases per 100 thousand on a given clinic-date.

We also controlled for clinic fixed effects (**clinic**) and day of the week-week fixed effects (**dayweek**), e.g. Thursday of week 14. Controlling for day of the week-by-week fixed effects allow us to compare days in 2020 to comparable days in 2019. We only used weekday visits in our analysis, so this gave us 85 day-of-the-week-by-week groups (e.g., Monday of week 11). Our time period encompassed epidemiological weeks 6 through 22, which is roughly February through May. Day 1 was Monday of week 6 and Day 85 was Friday of week 22 and so on. Finally, robust standard errors were clustered at the state level.

Results

Although our original sample included over 500 clinics, our balanced panel includes 317 clinics located in 43 states and the District of Columbia (see Figure 1). For various reasons, some states were omitted from the analysis. Louisiana, Kentucky and North Dakota were excluded

because we were unable to match any abortion providers in these states with locations in the Safegraph database. Arkansas, Hawaii, Missouri and West Virginia were excluded while balancing our panel because none of their clinics had data for each clinic-date in our time period. Finally, we chose to exclude South Dakota from our analysis because of the unique nature of abortion availability in the state.

Table 1 shows our summary statistics. We have 53,890 clinic-day observations in our data, corresponding to 317 clinics over 85 week days in each of two years. Of those observations, 15% (30% of the 2020 days) from when an elective procedure ban was in effect, and 1.3% (2.6% in 2020) are from when an explicit surgical abortion ban was also in effect. Because our sample is at the clinic level, we have relatively few observations in states that explicitly banned surgical abortion since those states have very few abortion clinics.

Figure 2 plots the raw daily difference in visit counts between 2020 and 2019. There is a notable decline in visits beginning around day 25, which corresponds to March 6 in 2020. This is also when many states announced states of emergency and began to take other steps to contain the pandemic and reduce mobility. On March 13 (day 30), President Trump declared a nationwide state of emergency.

Our event study (Figure 3) shows a steep drop off in clinic visits after procedure bans went into effect. Visits do not begin to increase again until approximately t=50, or 50 days after procedure bans were enacted, which is around mid-to-late May for most states. This pattern is true for states with elective procedure restrictions only as well as states that included surgical abortion in their restrictions. There is also a pronounced decline before these bans took effect, which reflects voluntary reductions in movement to abortion clinics. This is entirely consistent with Ziedan,

Simon, and Wing (2020) who found a steep decline in non-COVID healthcare utilization during the spring of 2020, not all of which can be attributed to state policies on elective healthcare.

We used several combinations of variables in our Poisson regressions, although a dummy for the year 2020 was always included. This dummy variable proved to be significant across all combinations, indicating that the pandemic year effect was highly determinative.

In Table 2, we show a significant decrease in traffic to abortion clinics in 2020 compared to 2019. However, we cannot attribute this to specific bans on surgical abortion. For example, when we control for COVID prevalence using cases per 100 thousand people, there was a 34 percent (0.29 log points)[4] decrease in visits in 2020, and states that banned elective medical procedures saw an additional 40 percent (0.328 log points) decrease. Both of these effects were significant at the 99 percent level. There was no significant additional impact in the states that specifically categorized surgical abortion as an elective procedure that ought to be postponed. Finally, we found a 0.025 percent (0.00025 log points) decrease for each case per 100 thousand people in the county, an effect that was significant at the 99 percent level.

When we used new cases per 100 thousand instead of the sum of cases, we found a 32 percent (0.277 log points) decrease in the year 2020 and a further 23 percent (0.205 log points) decrease from elective procedure bans; in this instance, these effects were significant at the 99 and 95 percent levels respectively. Again, we did not find a significant impact from specific surgical abortion bans in this permutation. Each new case per 100 thousand people was responsible for a further 0.21 percent decrease in visits, and this effect was also significant at the 99 percent level.

[4] Percentage change = $\ln(1+\beta)$

Robustness Checks

To ensure that the clinics included in our balanced panel were not inherently different from the rest of our original sample, we conducted several regressions on an indicator for whether or not a clinic was missing data. The clinics with missing data were excluded to balance the panel. The variables we tested included county population, the cumulative case sum per 100 thousand in the county, the maximum new daily cases per 100 thousand in the county, elective procedure bans and surgical abortion bans. The only significant variable was county population; although it was significant at the 95 percent level, the coefficient was 0.0000000131 per person, so it did not seem to have a large impact on whether a clinic would lack the full data for our time period. None of the other variables we tested showed consistent significance at the 90 percent level or higher. Given the nature of SafeGraph data, one would also expect to find clinics in denser locations—larger counties—to be less likely to be precisely identified, which also explains some of the missing data.

Discussion

Guttmacher has reported a consistent yearly decline in abortions (Nash and Dreweke 2019), so even in the absence of a pandemic it would be expected that fewer abortions would take place in 2020 than in 2019. However, using the most recent data, we can attempt to estimate how many additional abortions were prevented by the pandemic and related policies. As of September 2020, the most recent data available on abortions per state per year is from 2017. Guttmacher reported that 862,000 abortions took place in the United States in 2017, which is about a 6.9 percent decrease from 926,000 in 2014 and a 1.3 percent decrease from 874,000 in 2016 (Guttmacher Data Center 2020.)

Using our regression coefficients (Table 2, Column 2) and the Guttmacher data on state abortion rates in 2017, we can attempt to estimate the impact of the pandemic and related state policies. Our time period was 4 months, so these effects would impact about a third of the year.

For the United States as a whole, in a non-pandemic scenario with a consistent rate of decrease year to year, we would have expected about 840,000 abortions in 2019 (from a 1.3 percent decrease in each of 2018 and 2019) and about 829,000 in 2020 (from another 1.3 percent decrease). However, in our regression there was a 32 percent decrease from 2019 to 2020 during the 4-month time period. Therefore, we would assume about 750,000 (840,000 times a third of a 32 percent decrease) abortions would take place in the United States in 2020, which is about a 9 percent (comparing 750,000 and 829,000) decrease from what we would have expected from the downward trend from before the pandemic.

However, elective procedure bans were also responsible for significant decreases in clinic visits according to our regression. Therefore, states with this policy would see an even larger decrease in abortions. For example, Pennsylvania banned elective procedures for about 5 weeks (Raifman et al. 2020), or about 10 percent of the year. Since there were 31,260 abortions in Pennsylvania in 2017 (a 3 percent decrease from 32,230 in 2016), in the non-pandemic scenario outlined above we might expect around 29,400 abortions in 2019 (two more years of 3 percent decreases) and 28,500 abortions in 2020 (another 3 percent decrease). With the impact of the pandemic and elective procedure ban causing additional decreases, we would expect around 25,700 abortions (29,400 times a third of a 32 percent decrease and a tenth of a 23 percent decrease) to take place in Pennsylvania in 2020, a 10 percent decrease (comparing 25,700 and 28,500) from the non-pandemic scenario.

These estimates of the change in abortions assumes that the reduction in visits was spread proportionally across visits for abortions and visits for other services. This is a reasonable assumption because more targeted surgical abortion bans had no effect on the number of visits to abortion clinics. If reductions in visits were disproportionally arising from visits for non-abortion

services, so that the number of abortion visits remained constant, then a targeted surgical abortion ban should be effective at reducing visits to affected clinics.

A large number of clinics in our sample were Planned Parenthood health centers. Planned Parenthood claims that abortion accounts for only 3 percent of the services provided at their clinics (Planned Parenthood 2014.) Although the true proportion of Planned Parenthood's services constituted by abortion has been a source of controversy (Ye Hee Lee 2015), the 3 percent figure does have validity by at least one measure. The organization's 2013-14 annual report shows that abortion services made up 327,653 of 10.6 million services provided, which is about 3.1 percent (Planned Parenthood 2014.) In 2018-19, the proportion was 4 percent (Planned Parenthood 2019.) This statistic could explain why elective procedure bans (which would impact other Planned Parenthood services such as contraception or STD testing) had a steep impact on clinic visits while targeting surgical abortion specifically did not have a significant impact.

Conclusion

In this paper, we estimate the effects of a new Targeted Restriction of Abortion Providers (TRAP): explicitly prohibiting surgical abortions as elective surgery during a global pandemic. Our hypothesis was that these restrictions, like many other TRAP laws and policies, were going to reduce the volume of abortion services.

Unexpectedly, we found that this was not the case. While the overall volume of visits to abortion clinics decreased by 32 percent in 2020 compared to 2019, and states that banned elective surgical procedures saw an additional 23 percent decrease, states that also explicitly banned surgical abortions so no further decrease. These results can be rationalized through both demand and supply-side explanations. For example, if abortions are a relatively small share of a clinic's services then it may not be feasible to cover fixed costs if there are no patients coming in for other services to share the costs of providing common services. On the demand side, elective procedure

bans may have provided signals about the severity of the pandemic in an area, leading the marginal woman to decide against having an abortion.

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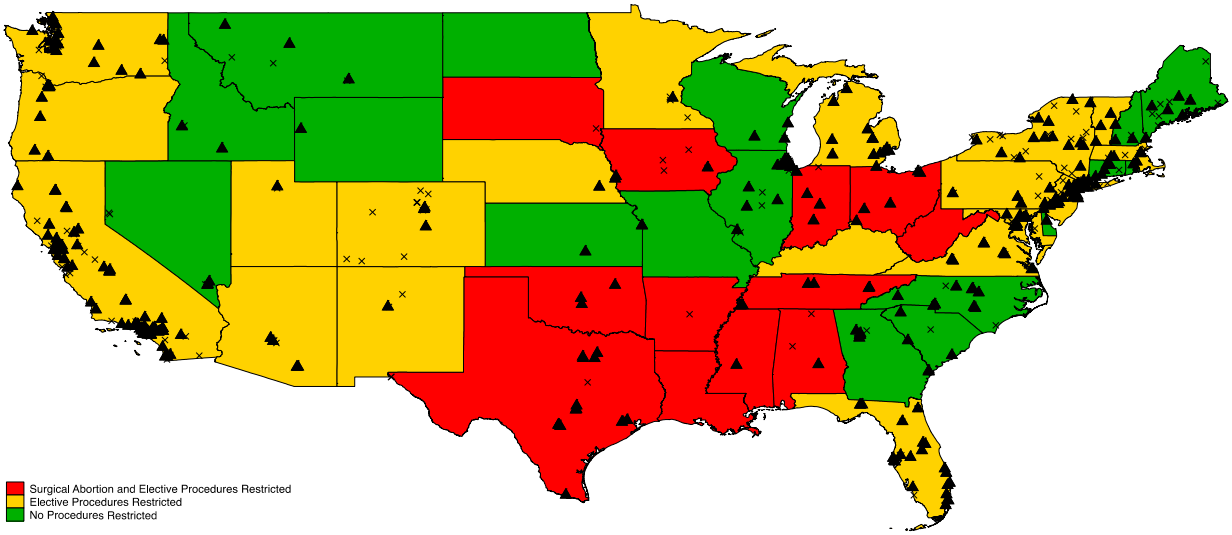
Figure 1: Procedure restrictions and clinic locations

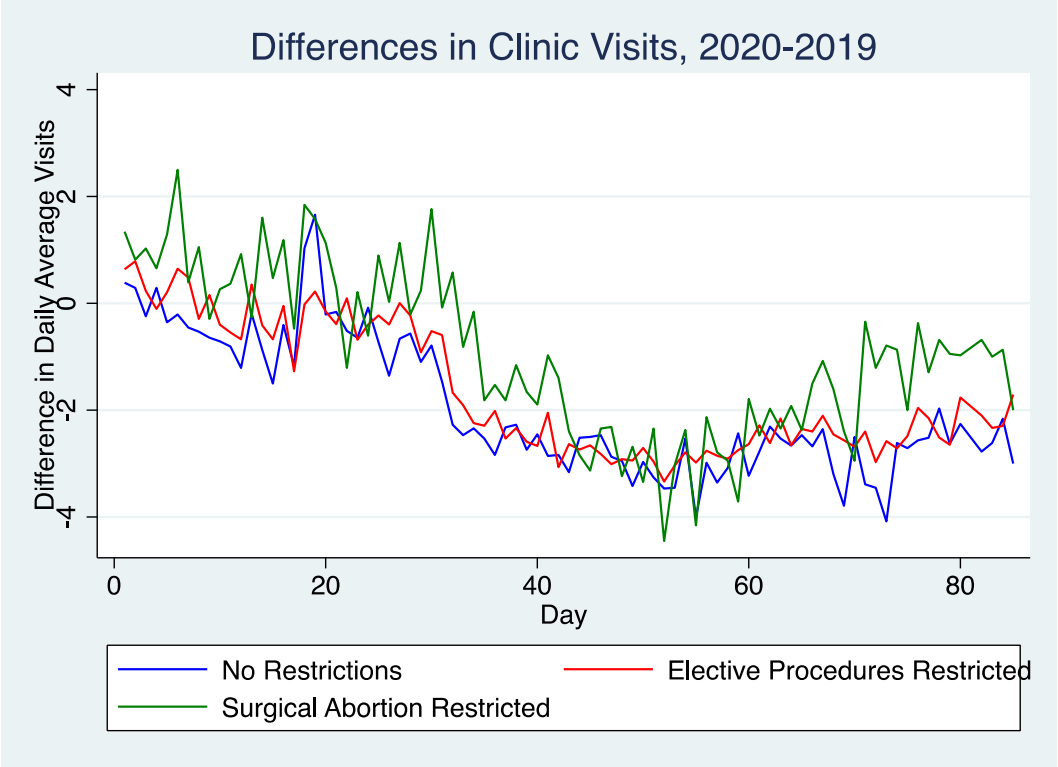


Notes: Triangles indicate clinics included in the balanced panel; Xs are clinics which were excluded. Not mapped are clinics without a Safegraph match

Table 1: Summary Statistics

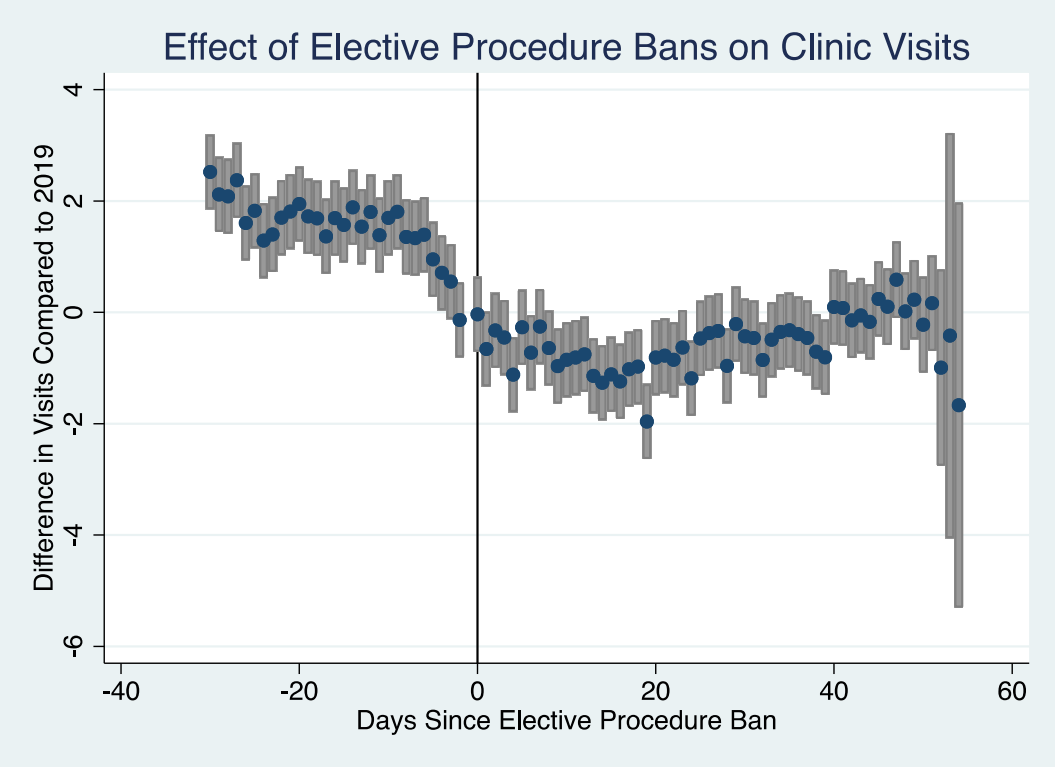
	(1) N	(2) Mean	(3) Std. Dev.	(4) Min.	(5) Max.
County Population	53,890	145,300	224,400	23,464	1,004,000
Cumulative Cases per 100k	53,890	740.1	675.9	0	3,604
New Cases per 100k	53,890	78.53	82.09	0	699.2
Holiday	53,890	0.0412	0.199	0	1
Surgical Abortion Ban	53,890	0.0127	0.112	0	1
Elective Procedure Ban	53,890	0.148	0.356	0	1
Year 2020	53,890	0.500	0.500	0	1

Figure 2: Raw Differences in Abortion Clinic Visits (2020 visits minus 2019 visits)



Notes: States with no restrictions (blue) include Connecticut, Delaware, Washington D.C., Georgia, Idaho, Illinois, Kansas, Maine, Montana, Nevada, New Hampshire, North Carolina, Rhode Island, South Carolina, Wisconsin and Wyoming. States restricting elective procedures (red) include Arizona, California, Colorado, Florida, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New Mexico, New York, Pennsylvania, Utah, Vermont, Virginia, and Washington. States restricting elective procedures and surgical abortion include Alabama, Alaska, Indiana, Iowa, Mississippi, Ohio, Tennessee, and Texas. Arkansas, Hawaii, Kentucky, Louisiana, Missouri, North Dakota, South Dakota, and West Virginia did not have clinics with sufficient data to include in this analysis. Day 1 is equivalent to Monday of epidemiological week 6 and Day 85 is equivalent to Friday of epidemiological week 22.

Figure 3: Elective Procedure Ban Event Study



Notes: Y axis shows the average difference in visits by clinic-date, comparing visits on a given day (e.g. Wednesday of epidemiological week 16) in 2020 with the same day in 2019. Shaded area represents 95% confidence interval for the difference between 2020 and 2019. Sample only includes clinics in states where elective procedures were temporarily banned.

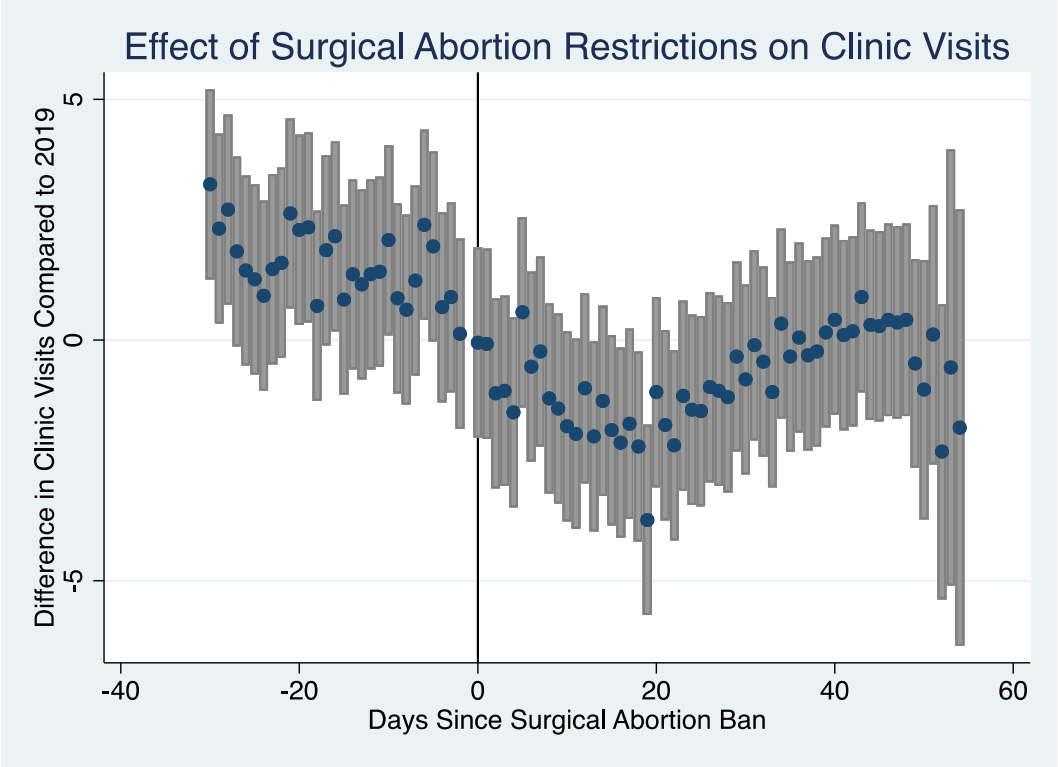
Table 2: Regression Results

	(1) Daily Visits	(2) Daily Visits
Year 2020	-0.290***	-0.277***
	(0.0525)	(0.0410)
Elective Procedure Ban	-0.328***	-0.205**
	(0.107)	(0.0974)
Surgical Abortion Ban	0.125	-0.00896
	(0.106)	(0.104)
Holiday	-0.104***	-0.0994***
	(0.0351)	(0.0374)
Covid Cases per 100k	-0.000248***	
	(6.15e-05)	
New Covid Cases per 100k		-0.00211***
		(0.000476)
Observations	53,890	53,890
Number of clinics	317	317

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Day of week of year (1-85) dummy variables were also included in this equation. Clinic fixed effects are clustered at the state level. Coefficients represent the average marginal effect of their respective variables.

Appendix

Appendix Figure 1: Surgical Abortion Ban Event Study



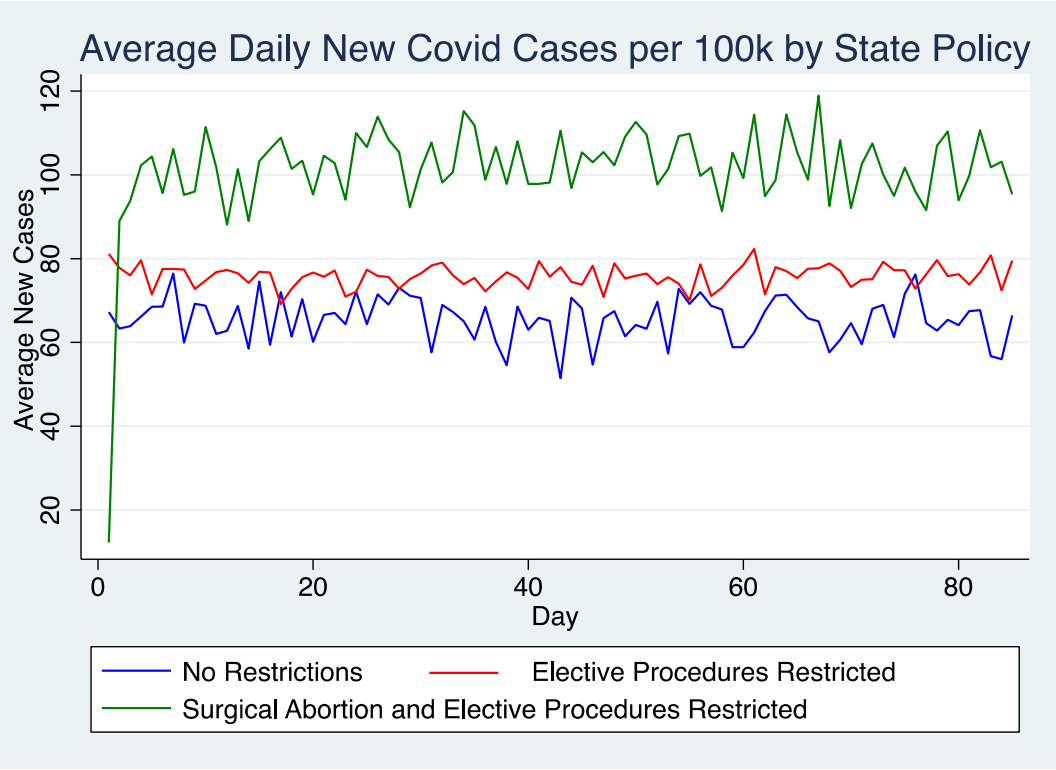
Notes: Y axis shows the average difference in visits by clinic-date, comparing visits on a given day (e.g. Wednesday of epidemiological week 16) in 2020 with the same day in 2019. Shaded area represents 95% confidence interval for the difference between 2020 and 2019. Sample only includes the clinics in states where surgical abortion was temporarily banned.

Appendix Table 2: Missing Clinic Regression Results

	(1)	(2)	(3)	(4)	(5)	(6)
	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data	Missing Data
Elective Procedure Ban	0.0495		0.0487		0.0700	0.0693
	(0.0575)		(0.0574)		(0.0595)	(0.0592)
County Population	1.31e-08**	1.27e-08**	1.35e-08**	1.31e-08**	1.12e-08**	1.17e-08**
	(5.23e-09)	(5.21e-09)	(5.32e-09)	(5.26e-09)	(5.27e-09)	(5.34e-09)
Maximum New Cases Per Day Per 100 Thousand People	-0.000177	-0.000199			-0.000211	
	(0.000197)	(0.000207)			(0.000197)	
Surgical Abortion Ban		-0.128*		-0.129*	-0.146*	-0.146*
		(0.0746)		(0.0720)	(0.0781)	(0.0752)
Cumulative Cases Per 100 Thousand People			-3.06e-05	-3.62e-05		-3.81e-05
			(5.07e-05)	(5.29e-05)		(5.04e-05)
Observations	524	524	524	524	524	524
R-squared	0.009	0.013	0.008	0.013	0.017	0.016

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Data on maximum new cases and cumulative cases per 100 thousand represent the maximum values within the February-May 2020 time period for the county where each clinic is located. Clinics are clustered by state.

Appendix Figure 3: Covid Cases by State Policy



Notes: States with no restrictions (blue) include Connecticut, Delaware, Washington D.C., Georgia, Idaho, Illinois, Kansas, Maine, Montana, Nevada, New Hampshire, North Carolina, Rhode Island, South Carolina, Wisconsin and Wyoming. States restricting elective procedures (red) include Arizona, California, Colorado, Florida, Maryland, Massachusetts, Michigan, Minnesota, Nebraska, New Jersey, New Mexico, New York, Pennsylvania, Utah, Vermont, Virginia, and Washington. States restricting elective procedures and surgical abortion include Alabama, Alaska, Indiana, Iowa, Mississippi, Ohio, Tennessee, and Texas. Arkansas, Hawaii, Kentucky, Louisiana, Missouri, North Dakota, South Dakota, and West Virginia did not have clinics with sufficient data to include in this analysis.

Appendix Table 3: Dates of State Level Policies

	Elective procedure ban	Elective procedures resume
Alabama	3/19/2020	4/30/2020
Alaska	3/19/2020	4/20/2020
Arizona	3/21/2020	5/1/2020
Arkansas	4/3/2020	4/27/2020
California	3/19/2020	4/20/2020
Colorado	3/23/2020	4/27/2020
Connecticut	n/a	n/a
Delaware	n/a	n/a
District of Columbia	n/a	n/a
Florida	3/20/2020	5/8/2020
Georgia	n/a	n/a
Hawaii	4/16/2020	4/26/2020
Idaho	n/a	n/a
Illinois	n/a	n/a
Indiana	3/16/2020	4/27/2020
Iowa	3/27/2020	4/27/2020
Kansas	n/a	n/a
Kentucky	3/18/2020	5/6/2020
Louisiana	3/18/2020	4/27/2020
Maine	n/a	n/a
Maryland	3/24/2020	5/7/2020
Massachusetts	3/18/2020	5/18/2020
Michigan	3/21/2020	5/29/2020
Minnesota	3/23/2020	5/10/2020
Mississippi	3/19/2020	4/24/2020
Missouri	n/a	n/a
Montana	n/a	n/a
Nebraska	4/3/2020	5/4/2020
Nevada	n/a	n/a
New Hampshire	n/a	n/a
New Jersey	3/27/2020	5/26/2020
New Mexico	3/27/2020	4/30/2020
New York	3/20/2020	6/8/2020
North Carolina	n/a	n/a
North Dakota	n/a	n/a
Ohio	3/18/2020	5/1/2020
Oklahoma	3/24/2020	4/24/2020
Oregon	3/18/2020	5/1/2020
Pennsylvania	3/20/2020	4/27/2020
Rhode Island	n/a	n/a
South Carolina	n/a	n/a
South Dakota	3/23/2020	4/28/2020

Tennessee	3/24/2020	5/1/2020
Texas	3/22/2020	4/21/2020
Utah	3/25/2020	4/22/2020
Vermont	3/20/2020	5/4/2020
Virginia	3/25/2020	5/1/2020
Washington	3/19/2020	4/29/2020
West Virginia	4/1/2020	4/20/2020
Wisconsin	n/a	n/a
Wyoming	n/a	n/a