Spatial variation in medical abortion: a component of abortion access

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Abstract

Medical abortion has been increasing as a share of all abortion in the US and in Texas. In 2013, Texas passed omnibus abortion restriction legislation including a requirement that medical abortion provision follow an outdated regimen approved by the Food and Drug Administration. This limited medical abortions to pregnancies of no more than 49 days and – together with existing Texas abortion laws – required women to make four clinic visits to receive medical abortion services. Furthermore, many clinics ceased offering medical abortion after the provision went into effect. I document that utilization of medical abortion – as a proportion of all eligible abortions – varies widely across Texas counties. Further, I exploit a plausibly exogenous shock to evaluate the extent to which this variation may reflect variation in demand. This variation may be evidence of a differential impact of this new type of abortion restriction on women in places where medical abortion is popular.

Introduction

The recent surge in state laws restricting abortion has focused on the supply side of abortion care, but restrictions on the provision of medical abortion may influence both supply and demand for abortion if women prefer medical abortion over a surgical procedure[1]. Texas and Ohio have both passed and implemented laws requiring that all medical abortions follow an outdated protocol from the Food and Drug Administration[2]. In Texas, most women must make four clinical visits to receive medical abortion and in both states physicians must follow out dated clinical guidelines. Similar laws have been enjoined in Arizona, North Dakota, and Oklahoma[2]. To the extent that these laws interfere with physicians' practice of medicine or prevent physicians from offering medical abortion, these laws are supply side restrictions. But to the extent that women may specifically desire medical abortion as opposed to surgical abortion, these laws may also directly deny women access to their preferred method of abortion care.

These laws can have dramatic impacts on the ratio of all abortions that are medical abortions. In the six months after the Texas law went into effect, medical abortions decreased as a proportion of all abortions by about 70%[3]. At the same time, abortions decreased by about 13% compared to a year before[3]. Recent dramatic cuts to subsidized family planning and the closure of 79 family planning clinics in the state indicate that it is highly unlikely that this decrease in abortion is due to a decrease in unintended pregnancy[4]. Clinic closures are hypothesized to play a substantial role in this decrease in abortion, but the decreased

accessibility of medical abortion may also play a role in the decreased abortion rate. Furthermore, the dramatic decrease in medical abortion may have impacted some women more dramatically than others. Women who are indifferent to the procedure type or who prefer surgical abortion would be less impacted than women who specifically desire medical abortion.

Such preferences are consistent with findings from the literatures of contraceptive method preference and studies of acceptability of medical abortion. Social science studies of contraception have found that social networks play a substantial role in shaping acceptance of family planning methods[5, 6]. While these studies sometimes frame women's uptake of contraceptive methods as "acceptance", they also recognize that preferences are structured by communities. Regarding abortion procedure methods, studies in the US and elsewhere have demonstrated that medical abortion is effective and acceptable to women, and that some women have preferences for specific types of abortion[7-9]. For example, among women with previous history of surgical abortion who had just selected medication abortion, the majority found medical abortion more acceptable[10]. In the present work, I hypothesize that women may hold preferences for specific abortion procedure methods, broadly categorized as medical or surgical.

I test this hypothesis first by examining spatial variation in the proportion of all abortions that are medication abortions by Texas county. Using weighted linear regression at the county level, I identify county-level characteristics that predict higher rates of medical abortion as a proportion of all abortion. Then I identify counties that had a provider who only provided medication abortion in the beginning of the period but who had no provider in the later part of the period. I use logistic regression to test the pre/post effect of losing this provider on the abortion procedure type received by women in these counties, using counties in the rest of the state as a control.

Methods

I use the universe of all legal abortions reported to the Texas Department of State Health Services in 2011. I include the 85,245 abortion with complete data on county and race. Using the microdata from the State, I sum medical and surgical abortions before 9 weeks gestation, by woman's county of residence. Dividing these two sums, I calculate the total proportion of all eligible abortions that were performed using medical for each county in Texas. Texas has 254 counties, 250 of which had residents who received abortions in 2011. I also use the percent of reproductive age women who are Hispanic calculated via the 2010 American Communities Survey API. Calculations and manipulations were performed in Stata 13.

I map the county-level proportions of eligible abortions that were medical using ARC GIS, coloring each county according to the proportion of medical abortions among all eligible abortions to women in that county, with darker colors indicating higher rates of medical abortion.

I use linear regression weighted by the total number of abortions in a county to evaluate the effect of county-level variables on the county's proportion of eligible abortions that were medical.

In one group of counties, medical abortion was the only locally available form of abortion care for the period before 1 October 2011. After 1 October 2011, women in these counties had to travel more than 3 hours to the nearest source of legal abortion care. I identify nearest provider based on a list of abortion providers kept by the Texas Policy Evaluation Project, using county centroids to calculate distance in ARC GIS. The 14 counties for which the nearest provider before October 1, 2011 provided only medical abortion were included as treatment counties. I compute proportions of medical abortions among eligible abortions to women from these counties during the period when medical abortion was the only locally available method (before October 1, 2011) and after no method was available locally (after October 1, 2011). I do the same for women in counties whose nearest provider provided both types of procedures (women in the rest of Texas), treating these women as controls.

I use logistic regression at the individual level to describe the effect of living near a provider who only provides medical abortion, having an abortion before or after October 1, 2011, the effect of living on the border, the effect of living in an area with a high Hispanic population, and the individual-level effects of race and ethnicity. A panel of dummies indicates the interaction of treatment county (counties where the nearest provider only provided medical abortion until October 1, 2011 and then closed on October 1, 2011) and abortion date before or after October 1, 2011. In the full paper I will group counties so that I can use mixed effects logistic regression to properly specify the contribution of between- and within-county variation to women's receipt of medical abortion as opposed to surgical abortion. Because Texas has 254 counties – some of which have fewer than five women receiving abortion in 2011 – grouping will be necessary for these multilevel models to converge. The present model is at the individual level with county-level covariates included.

Results

The maps in Figure 1 demonstrate a striking level of between-county variation in the proportion of eligible abortions that are medical as opposed to surgical within Texas. The counties range from less than 10% to about 80%. South and West Texas have higher proportions, and there is an area in the panhandle with very high proportions.

In the county-level model in Table 1, I find that counties with greater proportions of Hispanics in their reproductive age population, counties on the US-Mexico border, and counties whose only abortion provider solely provided medical abortion all have greater proportions of medical abortion.

In Table 2, I find that the proportion of medical abortions in counties with providers who only offered medical abortion did not change after the providers closed on October 1, 2011. This finding is borne out more robustly by the individual level regressions in Table 3. Specifically, the confidence intervals for the odds-ratio of medical abortion estimates for the treatment counties before and after the provider closed overlap broadly. The odds of medical abortion in treatment counties before October 1, 2011 was estimated to be 9.57 (CI 4.79, 19.09), while the odds in the same counties after October 1, 2011 was estimated to be 7.92 (CI 5.91, 10.61). This indicates that women in these counties had very high rates while their nearest provider only offered medical abortion and that these very high rates persisted even after these women had to travel three or more hours to the nearest clinic.

Discussion

Using vital statistics from Texas, I examine the spatial distribution of rates of medical abortion before these restrictions took effect. At the county level, medical abortions range from <10% to over 80% of eligible abortions, pointing to spatial inequalities in the impact of restrictions targeting medical abortion. Some of the places with very high proportions of medical abortion may have had high rates because their only provider did not offer surgical procedures. However, these high rates persisted even when the provider closed, indicating that these communities established a preference for medical abortion and it remained even when women from these counties had to travel far from their communities to access abortion. Social networks may influence abortion procedure type preferences as they influence contraceptive method preference.

I find that some areas of Texas have very high rates of medical abortion as a proportion of all eligible abortions. While the statewide percent is about 24% of all eligible abortions, the counties range from about 80% to almost zero. This wide spatial variation has been

documented to my knowledge. Furthermore, I find that in areas where it is plausible that supply is driving these very high rates of medical abortion among all abortions, the high rates persist even when the supply-side constraint disappears. It is possible that women in some places may specifically desire medical abortion as opposed to surgical abortion, just as women may develop preferences for methods of contraception that have already proven acceptable to members of their community and network.

Analyses of contraceptive behavior have long attended to the role of social networks in diffusing method-specific contraceptive knowledge and behavior [6, 11]. Scholars of contraception and fertility have also pointed out that the path-dependent nature of social learning can lead to spatial variation in contraceptive method mixes[6]. Here I demonstrate the existence of dramatic spatial variation in abortion method mix and provide evidence that once this variation is established in a community, even if it is established via a supply constraint, preferences or habits enable it to persist. If it were not the case that the women in the treatment counties sought medical abortion specifically when they traveled to other parts of the state to receive abortions after their clinic closed in October 2011, we would expect that the proportion of medical abortion among these women would resemble the state rate, or at least would be less than it was in the period when their nearest provider only offered medical abortion. However, this is not the case. Therefore, this study provides some evidence that communities may shape women's preferences for medical abortion as opposed to surgical abortion.

This is limited by the absence of specific measures of women's preferences. Additionally, the relatively small populations and small numbers of abortions to women in the treatment counties mean that my findings should be interpreted with caution. This is especially true because my main finding is a null result – that the confidence intervals for the before and after dummies for the treatment counties overlap. If the clinic that closed on October 1, 2011 closed because of something that was associated with women's preference for medical abortion in the treatment counties, the findings also may be subject to a different interpretation. However, the finding that Texas counties vary so widely in their proportions of eligible abortions that are medical is robust and important in its own right. And it seems unlikely that the clinic would have closed because women in the treatment counties did not want medical abortion, since they continued to seek it far from home after the clinic closed.

If some women, or some communities, strongly prefer medical abortion to surgical abortion, these women and communities would be the most impacted by state restrictions on the provision of medical abortion. Further work should investigate this study's indication of such

preferences because such differential impact may mean that some subpopulations are impacted by this type of abortion restriction more harshly than others. Such a differential impact could exacerbate inequalities in health and may point advocates to avenues for challenging the laws. Social scientists who study social networks and contraceptive choice may also find that their work applies to abortion procedure preference. Such an extension of that literature to abortion might provide a causal explanation for the findings observed here. Furthermore, utilization of abortion care itself may be subject to similar forces of social network learning. If so, explanations for wide spatial variation in rates of abortion may be understood more fully.

Figure 1. Medical abortion as a proportion of eligible abortions by woman's county of residence, Texas 2011

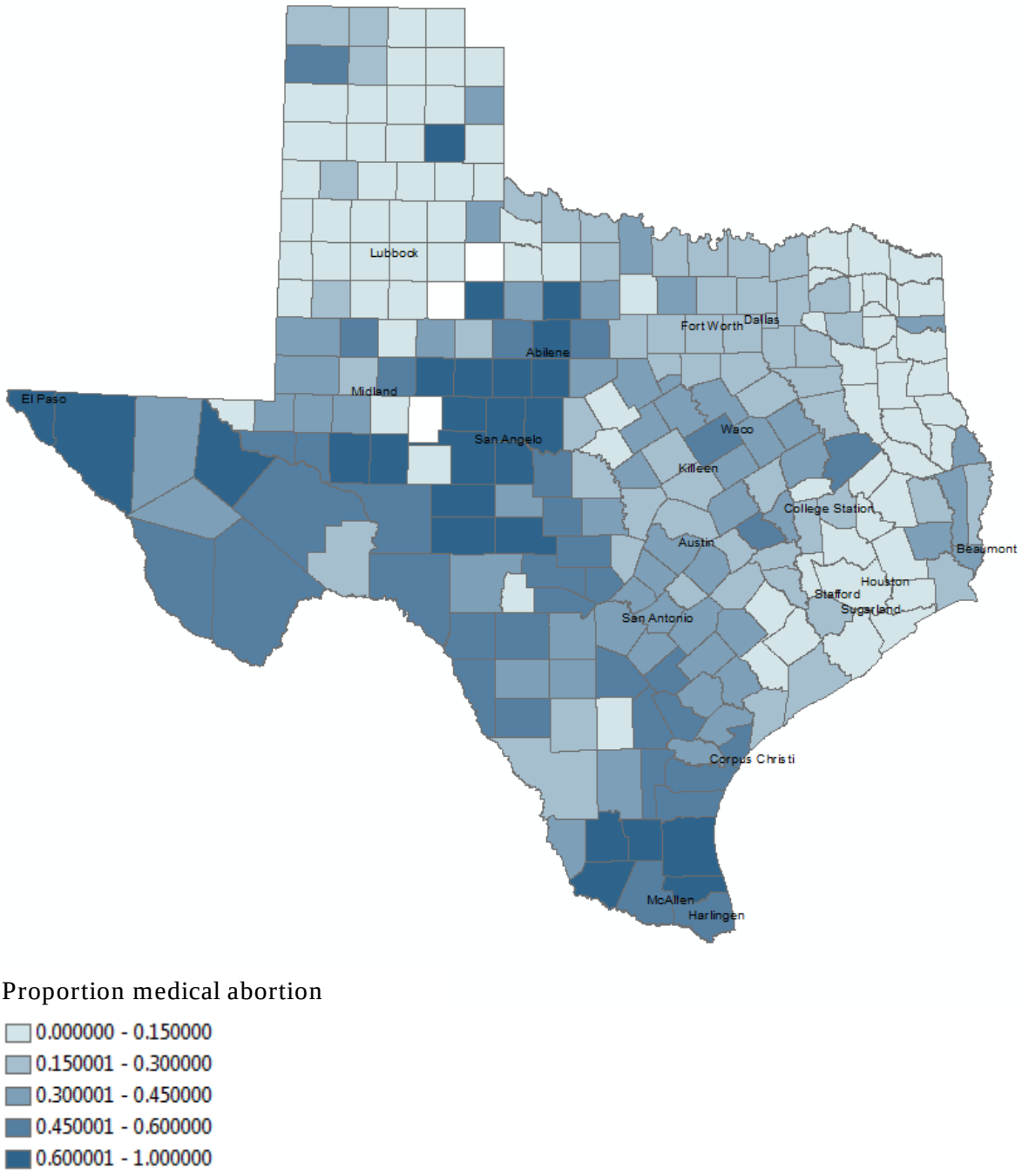

Table 1. County-level regression of proportion medical abortion

	β	Standard error	t	P>|t|	95% Confidence Interval	
Percent Hispanic	0.002	0.001	3.3	0.001	0.001	0.003
Border	0.274	0.041	6.66	0	0.193	0.355
Closest provider only offers medical AB	0.523	0.129	4.06	0	0.269	0.776
Constant	0.161	0.023	7.11	0	0.116	0.205

Table 2. Treatment counties versus control counties

	Treatment Counties		Control Counties	
	Surgical abortions	Medical abortions	Surgical abortions	Medical abortions
Before October 1, 2011	63	179	54,910	18,926
After October 1, 2011	11	33	11,475	4,125

Table 3. Individual-level logistic regression of medial abortion

	OR	Standard error	z	P>|z|	95% Confidence Interval	
Race/Ethnicity						
White	(reference)					
Black	0.33	0.01	-45.48	0	0.311	0.342
Asian	0.75	0.03	-7.16	0	0.696	0.813
Other	0.71	0.04	-5.9	0	0.638	0.798
Hispanic	0.61	0.01	-24.31	0	0.585	0.634
Closest provider provides surgical and medical AB	(reference)					
Closest provider provides surgical and medical AB	0.95	0.02	-2.38	0.017	0.911	0.991
Closest provider medical AB only	9.57	3.37	6.41	0	4.794	19.086
Previously closest provider medical AB only	7.92	1.18	13.85	0	5.910	10.614
County Level Variables						
Percent Hispanic	1.02	0.00	21.94	0	1.014	1.016
Border county	2.53	0.11	21.94	0	2.331	2.752
Constant	0.28	0.01	-40.43	0	0.262	0.297

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