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REGULATING ABORTION:
IMPACT ON PATIENTS AND PROVIDERS IN TEXAS

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ABSTRACT

The state of Texas began enforcement of the Woman's Right to Know (WRTK) Act on January 1, 2004. The law requires that all abortions at 16 weeks gestation or later be performed in an ambulatory surgical center (ASC). In the month the law went into effect, not one of Texas's 54 non-hospital abortion providers met the requirements of a surgical center. The effect was immediate and dramatic. The number of abortions performed in Texas at 16 weeks gestation or later dropped 88 %, from 3642 in 2003 to 446 in 2004, while the number of residents who left the state for a late abortion almost quadrupled. By 2006, an ASC had opened in 4 major cities down from 9 in 2003 but the abortion rate 16 weeks or more gestation remained 50 percent below its pre-Act level. Regulations of abortion providers that require new facilities or costly renovations could have profound effects on the market for second trimester abortions.

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An online appendix is available at:
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I. INTRODUCTION

The state of Texas began enforcement of the Woman's Right to Know (WRTK) Act on January 1, 2004. The law has two major components. The first requires that at least 24 hours before an abortion is performed, the patient receive information about the procedure and alternatives to terminating the pregnancy. The information can be delivered via a telephone recording, by means of a video or in person. It also requires that women be given the right to read *A Woman's Right to Know*, a pamphlet that graphically illustrates the growth of the fetus during pregnancy. The other major component of the WRTK Act requires that all abortions at 16 weeks gestation or later be performed in an ambulatory surgical center (ASC). ASCs have more demanding requirements with respect to infrastructure and staffing than free-standing abortion clinics.¹ At the time the law went into effect, not one of Texas's non-hospital abortion providers qualified as an ASC. The result was a dramatic decline in the availability of abortion services after 15 weeks gestation within the state.

In this study, we analyze how the sudden loss of abortion services after 15 weeks gestation in Texas changed (1) the incidence and timing of abortions, (2) the type of facility in which abortions are performed, and (3) the number of abortions obtained out of state by residents of Texas. We also examine whether the mandated information and waiting-period component of the law was associated with changes in abortion rates prior to 16 weeks gestation.

We make several contributions. First, there has been no published work on the effect of regulations directed at abortion providers on the incidence of abortion. Research on abortion policy have focused on the impact of Medicaid financing of abortion, parental involvement laws

¹ The Texas administrative code for abortion facilities and ASCs is available at <http://www.dshs.state.tx.us/hfp/rules.shtm>.

and mandatory counseling and waiting periods on reproductive outcomes.² We characterize these as demand-side policies because they are directed largely at the patients and have relatively little impact on the cost of providing services. One reason for the lack of research on supply-side policies is that regulations vary greatly across states. They range from regulations related to the training and qualification of staff to the size and number of chairs in recovery rooms. The effect of many such policies on the cost and availability of abortion services is probably small and difficult to evaluate. However, the requirement that abortions of a specific gestation be performed in a hospital or an ambulatory surgical center (ASC) can be very costly for it generally necessitates extensive renovations or even the construction of a new facility.³ As we show below, not one of Texas's 54 non-hospital abortion providers met the standard of an ASC in January of 2004 and it took 12 months before the first ASC capable of performing abortions opened. While a number of Texas hospitals perform abortions late in gestation, the proportion of late terminations that are performed is very small. In 2003, for example, only 286 of 79,166 abortions performed in the state (0.3%) were done in a hospital (Texas Department of State Health Services 2003). Hospitals, therefore did not substitute for the lack of late-term abortion providers in the state.

The WRTK Act also allows us to test whether mandated information and waiting periods affect the demand for abortion. The evidence to date is mixed. Of the 24 states that enforce such

² See Bitler and Zavodny (2001), Blank, George and London (1996), Cartoff and Klerman (1986), Colman, Joyce and Kaestner (2008), Cook et al. (1999), Ellertson (1997), Haas-Wilson (1996), Henshaw (1995), Joyce, Henshaw and Skatrud (1997), Joyce and Kaestner (1996), Joyce, Kaestner and Colman (2006), Kane and Staiger (1996), Levine (2003), Levine et al. (1999), Rogers et al. (1991), Trussell et al. (1980).

³ In Missouri, for example, a 2007 law requires that any provider that performs 5 or more abortions a month or performs abortions 12 weeks or more gestation must meet the standards of ambulatory surgical center. A state judge has issued a temporary restraining order noting that the Plaintiff's two clinics would have to close. In his ruling, the judge concluded, "The economic harm [*to the provider*] coupled with the harm suffered by patients who are delayed or prohibited from receiving an abortion outweighs the harm to the Defendants from the delayed application of the new law" (italics added) [see *Planned Parenthood of Kansas and Mid-Missouri, Inc. v. Drummond*, Case No. 07-4164-CV-C-ODS (W.D. MI. August 27, 2007)].

laws, 17 allow information to be delivered over the phone, through the mail, or via the internet. Seven states require that a woman receive the mandated information in person, which necessitates at least 2 visits to an abortion provider (Guttmacher Institute 2009). Studies based on data from Mississippi, a state that requires an in-person information session and a 24-hour waiting period, found that abortion rates fell about 10% in the period after the law and that the proportion of second-trimester abortions increased by 40% (Althaus and Henshaw 1994; Joyce, Henshaw and Skatrud 1997; Joyce and Kaestner 2000). There is little evidence that laws that permit information to be delivered other than in person, such as Texas's statute, have any effect on abortion rates (Bitler and Zavodny 2001).

Our primary source of data consists of individual-level records on all abortions that occurred in Texas from 2001 to 2006. Despite the detail of these data, most abortions to residents of Texas obtained in other states are not captured by this reporting system. Data on abortion in the US are collected generally by state of occurrence. Unlike births, there is no reciprocal reporting system among state vital statistics departments for induced terminations. Evaluation of state abortion policy based on abortions by state of occurrence can greatly misrepresent the change in abortion as women obtain abortions outside their state or residence (Cartoff and Klerman 1986; Henshaw 1995; Ellertson 1997). To avoid potentially spurious findings, we collected data on abortions from surrounding states to determine how many residents of Texas left the state to terminate their pregnancy after the law.

Our results are striking. We find that Texas's WRTK Act was associated with a 69% decline in the number of abortions 16 weeks or greater in the first year after the law despite a four-fold increase in the number of Texas residents who went out of state for an abortion after 15 weeks gestation. Three years after the WRTK Act despite the opening of ambulatory surgical

centers for abortion in Austin, Dallas, Houston, and San Antonio, the rate of abortion 16 weeks or more gestation remains less than 50% below its pre-Act level. We estimate that there were upwards of 5,354 pregnancies that would have been terminated in absence of the law. We speculate that the vast majority resulted in unintended births. We found no decline in rate of abortion before 16 weeks gestation. The mandatory information session and 24-hour waiting period appears to have had no effect on abortion rates.

We also present evidence that charges for abortions at 20 weeks increased in Texas approximately 37 percent after the WRTK Act, suggestive of a leftward shift in the supply of abortion services. There was no increase in the charge for abortions at 10 weeks gestation, which is consistent with the lack of change in the abortion rate prior to 16 weeks. Finally, we uncovered a rise in abortions reported at 15 weeks gestation but no increase in abortions at 13 or 14 weeks. We speculate that abortion providers who were not able to convert their facilities to an ASC, increased efforts to schedule women just before the 16-week cutoff.

II. EMPIRICAL IMPLEMENTATION

A. Conceptual considerations

As noted above, the WRTK Act has two major components. The first requires that women sign a statement saying that they received the state mandated information from the physician and that they have viewed the requisite material on the Texas Department of State Health Services website at least 24 hours prior to the termination

<http://www.dshs.state.tx.us/wrtk/default.shtm>.⁴ Since women can access the material over the internet, the cost of compliance to both the patient and provider would seem inconsequential.

⁴ For an illustration of an information session see the video by Dr. Rosenfeld of the Houston Women's Clinic at <http://www.houstonwomensclinic.com>. A copy of the pamphlet are available on the website of the Texas Department of State Health Services (DSHS; <http://www.dshs.state.tx.us/wrtk/default.shtm>).

Nevertheless, we cannot dismiss the possibility that mandated information and a 24-hour delay might persuade some women to forgo an abortion. If so, then we should observe a decline in abortions both less than 16 weeks as well as those at 16 weeks or more gestation.

The second component of the WRTK Act requires that abortions at or after 16 weeks gestation be performed in an ambulatory surgical center (ASC). This caused a sudden decrease in the availability of late-pregnancy abortion services within Texas as none of the non-hospital providers qualified as an ASC when the law went into effect. To illustrate, Figure 1 shows counties in Texas and surrounding states that have at least one non-hospital provider that performed abortions at or after 16 weeks gestation in 2003.⁵ In that year the population-weighted average straight-line distance from a woman's county of residence to the nearest county with non-hospital, late-pregnancy abortion services was 33 miles. With the loss of the in-state services in January of 2004, the average distance increased to 252 miles based on distance to the nearest out-of-state provider in Arkansas, Louisiana, New Mexico and Oklahoma.⁶

The decreased availability of late-pregnancy abortion services in Texas left pregnant women in Texas who wanted to terminate their pregnancy with four options: 1) terminate the pregnancy in Texas before the 16th week of gestation; 2) obtain an abortion at 16 weeks or more gestation in another state; 3) arrange for a late abortion within a hospital in Texas; or 4) carry the pregnancy to term. The first option is only viable if a woman's decision to abort has been made sufficiently early in pregnancy. However, the most important determinant of a late abortion is delayed recognition of the pregnancy and the absence of pregnancy symptoms. In one survey, 58 percent of women who had a second trimester abortion did not obtain a pregnancy test until

⁵ Although hospitals in Texas perform abortions, they are not significant providers. As we show in Table 1 the number of abortions at 16 weeks or more gestation fell from 569 in 2001-2003 to 523 in 2004-2006.

⁶ We present a detailed description of the sources used to identify the location of abortion facilities, how we computed average distances, and a map of the counties with such facilities in the Appendix.

the second trimester (Drey et al. 2006). Other determinants of a second trimester abortion include difficulty arranging finances and referrals to other clinics. In other words, many abortions that occur later in pregnancy result from delayed recognition of the pregnancy and from unanticipated difficulties in accessing abortion services. Nevertheless, the law should motivate women to seek—and providers to encourage—abortions before the 16th week of gestation.

The second option—travel to a different state—is demanding logistically and financially. Abortions at 16-19 weeks gestation cost between \$774 and \$1,170 dollars in 2001 and require two visits on two consecutive days to complete (Finer and Henshaw 2003). An abortion at 20 weeks or more gestation is more costly and may require 3 days to complete.⁷ Thus, women in Texas traveling out of state for a late-pregnancy abortion incur increased costs associated with transportation and possible overnight stays.⁸ A third option is to arrange for an abortion within a hospital in Texas. Hospitals are not significant providers of abortion services nationally or in Texas. From 2001 to 2003, the three years prior to the WRTK Act, only 822 or 0.4 percent of all abortions obtained in Texas were performed in hospitals (See Table 1). Moreover, abortions in hospitals cost approximately six times more than abortions obtained in clinics (Henshaw 1995). Hospitals, therefore, are unlikely to be an option for the over 3,000 women who needed late abortion services in Texas in 2004.

⁷ See Henshaw and Finer (2003). Large abortion providers now post details about the procedure on the internet. These instructions shown at the link below are from one of the first providers in Texas to open an ambulatory surgical center in 2005. <http://www.gynpages.com/aaronwhc/3.html>

⁸ An additional expense is incurred by Texas residents seeking an abortion in Louisiana. State law in Louisiana requires that all women planning to undergo an abortion receive, *in person*, state mandated information regarding the fetus and alternatives to abortion 24 hours before the abortion procedure can begin. This adds an additional day to all abortions. Thus, an abortion at 20 weeks can take up to 4 days to complete in Louisiana.

The last option is for women to carry the pregnancy to term. This may seem extreme given the time, money and commitment needed to raise a child. But the sudden withdrawal of late-pregnancy abortion services in Texas required that women be able to arrange and finance a termination in another state within a relatively short time-period. The immediate need for upwards of a \$1,000 dollars plus the time away from work or younger children may induce women with less resources and support to carry the pregnancy to term. This is the conclusion reached by researchers who found that a sudden cutoff of Medicaid funding of abortion in North Carolina was associated with a significant increase in births (Cook et al. 1999).

To summarize, the loss of late-pregnancy abortion services within Texas leads to several predictions. First, we expect abortions 16 weeks or more gestation to fall within Texas due to the leftward shift in the supply of abortion services. Second, we should see an increase in abortions to residents of Texas obtained in other states. Third, we may observe an increase in abortions of gestations just below the 16th week threshold as patients attempt to access local services and providers try to limit losses in revenue from the falloff in late-pregnancy terminations. The magnitude of these changes depends on how quickly providers respond by renovating existing facilities or building new ones that qualify as an ASC. By 2006 four counties had providers that performed abortions after 15 weeks gestation in a non-hospital setting and the average distance to the nearest provider of late-pregnancy abortion services had fallen from 252 miles in January, 2004 to 53 in 2006. Nevertheless, we would expect charges for late-pregnancy abortions to rise given the reduced number of providers. Increased charges coupled with greater travel may prevent the rate of abortion 16 weeks or more gestation from returning to its pre-Act level.

III. DATA

A. *Vital records from Texas*

After receiving institutional review board approval from the Texas DSHS, we obtained all individual abortion certificates from 2001 to 2006 for abortions that were performed in Texas. These certificates include data on the patient's age, marital status, and race/ethnicity; the type of abortion provider (clinic, ASC, hospital, or other); the county in which the abortion occurred; and the county of residence if the patient lives in Texas or her state of residence if she does not. We use the clinician's estimate of gestation in weeks to measure age of the fetus at termination. The reporting of patient's age, gestational age of the fetus, and place of residence on abortion certificates is usually complete. For example, of the 470,009 abortions that occurred in Texas from 2001 to 2006, state of residence was unknown in only 1918 (0.41%) cases, and 451,174 records were known to be of Texas residents. Among Texas residents, 2327 (0.52%) cases had missing information on gestational age and were therefore excluded from the analysis.

B. *Abortions in other states*

The Texas DSHS, with few exceptions, collects information on abortions that are performed in Texas and therefore cannot provide complete information on abortions that Texas residents obtained in another state. To obtain a more accurate count of all abortions obtained by Texas residents, we collected information on the number of abortions to residents of Texas recorded by the state health departments in neighboring and nearby states.⁹ We obtained information on the number of abortions obtained by Texas residents in Arkansas, Kansas, New Mexico, and Oklahoma from 2001 to 2006, by age of patient (<20 and \geq 20) and gestational age

⁹ We provide information on the completeness of abortion surveillance by the state health departments of the nearby states in the Appendix.

of the fetus (<16 weeks and \geq 16 weeks). From Colorado, Mississippi, Missouri, and Tennessee, we obtained the number of abortions obtained by Texas residents in the states by gestational age (<16 weeks and \geq 16 weeks) of the fetus for the years 2002 to 2006. In these states we used the 2002 figure as an estimate for 2001. In 2002, there were 3 abortions to residents of Texas 16 weeks or more gestation performed in Colorado and none in Mississippi, Missouri and Tennessee. Abortion records from Louisiana are more limited. Data for 2006 are not available, and residency status was not reported on Louisiana abortion certificates until 2004. As we describe in the Appendix, we derived a conservative algorithm to estimate the number of abortions to Texas residents obtained in Louisiana in 2001-2006.

Three states (Arkansas, Kansas, and Oklahoma) provided data on induced abortions to residents of each state by age of patient and gestational age of the fetus (<16 weeks and \geq 16 weeks) from 2001 to 2006. We contrasted changes in the resident abortion rates in these 3 states to changes in the resident abortion rate in Texas stratified by year, patient's age, and gestational age of the fetus. Population estimates by year, state, age, and sex used for the calculation of abortion rates are from the Population Division of the US Census Bureau (Annual state population estimates by demographic characteristics with 6 race groups [5 race alone groups and one group with 2 or more race groups]: April 1, 2000, to July 1, 2007 [SC-EST2007-alldata6]; Source: Population Division, US Census Bureau; Release Date: May 1, 2008).

IV. ANALYSIS AND RESULTS

A. Changes in number of abortions in-state and out-of-state

The yearly average number of late terminations (at or after 16 weeks gestation) obtained by Texas residents in-state was 3651 during 2001-2003 (Figure 2a). This number declined to 446

abortions in 2004, the first year the WRTK Act was in effect. This represents a decline of 88% between 2003 and 2004. During the same period, the number of late terminations obtained by Texas residents in a nearby state increased from 187 in 2003 to 736 in 2004, or by nearly 300%. In 2005, the number of in-state late terminations rose modestly, and the number obtained out of state declined. However, in 2006, the number of late terminations performed in Texas was still less than half the pre-law level (1,454 vs. 3,642).

In contrast to changes in the number of late-term abortions, there was little variation in the number of early terminations (less than 16 weeks gestation) between 2001 and 2006 (Figure 2b). In 2003, Texas residents obtained a total of 71,666 early terminations in state and 201 out of state. In 2004, the number obtained in Texas declined to 71,179 or by 0.7%, and the number obtained out of state increased to 266 or by 32%.

B. Characteristics of abortion patients

In Table 1 we show the demographic characteristics of Texas residents who obtained an abortion in Texas between 2001 and 2006, and the distribution of abortions by the type of abortion facility. Data are further stratified by the period (2001-2003 vs. 2004-2006) in which the abortion was performed and gestational age of the fetus (<16 weeks vs. ≥16 weeks). As is apparent from Table 1, during 2001-2003, clinics were the primary providers of late-term abortions in Texas; of the 10,954 late-term abortions to residents of Texas, 10,387 or 95% were obtained in an abortion clinic. This changed dramatically in the post-Act period (2004-2006), when ASCs became the primary providers of late-term abortions; of the 3,155 late terminations, 2371 or 76% were performed in an ASC. Due to the large decline in the total number of late-term abortions performed in Texas, the proportion of late terminations performed in a hospital

increased from 5.1% in 2001-2003 to 16.7% in 2004-2006. However, the number of late terminations performed in a hospital actually declined slightly from 559 in 2001-2003 to 520 in 2004-2006. The relatively small number of hospital abortions and the lack of change between the two periods indicate that hospitals are not an alternative for women seeking late-pregnancy abortion services in Texas.¹⁰

The age distribution of women having an abortion differs by the gestational age of the fetus. In 2001-2003, for example, teens accounted for 17.6% of early terminations, but 26.9% of late terminations. The majority of both early and late terminations were to unmarried women. In 2001-2003, about 35.4% of late-term abortions were to white women, 25.6% were to African American women, and 33.7% to Hispanic women. The racial distribution of early abortions was comparable. There were no meaningful differences in the proportion of abortions by age, marital status, or race/ethnicity between the two periods.

C. Changes in the rate of late abortions

The trend in the late-term abortion rate among Texas residents parallels the trend in the number of late-terminations (Figure 3a). The rate varied little between 2001 and 2003, before dropping dramatically from 0.78 in 2003 to 0.24 in 2004, the first year the WRTK Act was in effect. Between 2004 and 2006, it began to rise, as the number of abortion clinics that qualified as ASCs increased. The rate of late-term abortions among adult residents of the 3 nearby states

¹⁰ Women who use hospitals in Texas as compared to non-hospital facilities are much more likely to be older, white and married. The difference in marital status is particularly striking. Only 17.1 percent of late abortions in non-hospital facilities are to married women as compared to 71.7 percent of late abortions in hospitals (figures not shown). Differences by age and race are also noteworthy. Twenty-seven percent of all late abortions in hospitals are to women 35 years of age or older as compared to only 8.3 percent in non-hospital facilities and 50.3 percent are white as compared to 38 percent in non-hospital clinics. The data suggest that many abortions performed in hospitals in Texas involve fetal abnormalities. This would explain, in part, why hospitals in Texas did not serve as an alternative site for the roughly 3,000 women seeking late abortion services in 2004.

(Arkansas, Kansas, and Oklahoma) was relatively stable between 2001 and 2006. It declined from 0.49 per 1000 in 2001 to 0.36 in 2006 (Figure 3a).

To test the association between the WRTK Act and the late (≥ 16 weeks gestation) abortion rate in Texas, we used a simple difference-in-differences (DD) estimator, and compared the change in the rate of late abortions among teen and adult residents of Texas between the pre- and post-law periods with the change in the rate among residents in three neighboring states, Arkansas, Kansas and New Mexico. Specifically, we regressed the abortion rate on an indicator for Texas relative to the 3 neighboring states (Arkansas, Kansas, and Oklahoma), an indicator for the post-WRTK Act years (2004-2006) relative to the 3 years prior, and an interaction of the Texas and post-law period indicators. We also included a linear-trend term, and allowed the trend to vary for Texas relative to the other states. The coefficient on the interaction between the Texas and the post-law period indicator estimates the change in the abortion rate from before to after the WRTK Act in Texas relative to the comparison states, adjusted for state-specific linear trends. We adjusted the standard errors for a general form of heteroskedasticity using the robust command in Stata 10.0 (Stata Corporation 2008).

The rate of late abortions is defined as the number of abortions at or after 16 weeks gestation per 1000 females aged 15 to 44. We analyze rates for adults and teens separately. Abortion rates for teens are defined as the number of abortions to women under age 20 per 1000 women ages 15 to 19, and adult rates are calculated as the number of abortions to women ages 20 or older per 1000 women ages 20 to 44.

According to the regression estimates, the rate of late abortions to teenaged residents of Texas fell by 0.66 more abortions per 1000 women between the pre- and post-Act years compared to the decline in the rate among residents of the nearby states (Table 2, Panel A,

column 2). This represents a relative decline of 50 percent as evaluated at the pre-Act mean of 1.31. The late abortion rate among adult residents of Texas declined by 0.33 abortions per 1000 women, or about half of the decline among teens. The relative decline among adults, however, was very similar to the decline experienced by teens (50.4 percent and 49.7 percent , respectively). Overall, the decline among residents of all ages was 0.40 abortions per 1000, or 50.5 percent as evaluated at the pre-Act mean rate of 0.79.

While the neighboring states seem the most natural choice for the counterfactual for the trends in the abortion rates in Texas, one concern is the relatively large difference in the level of the abortion rate between Texas and the neighboring states. Specifically, the abortion rate in the neighboring states was approximately 40 percent lower in magnitude compared to Texas in the years before the enforcement of the WRTK Act (Figure 3a). Differences in the baseline level of the outcome may suggest other forms of confounding that are not be fully absorbed by the controls in our model (Meyer 1995). Furthermore, we are concerned that the late-term abortion rate of residents of neighboring states may be affected by the WRTK Act, since some residents of these states may have relied on Texas providers for a late termination. Thus, as a robustness check, we computed the rate of abortion at 16 weeks or more gestation from 31 states and the District of Columbia that reported data on the gestational age of abortions to the CDC from 2001 to 2006 (from here on 32 states). The disadvantage of the CDC data is that they are not available by age and the reporting is based on state of occurrence and not residence. We excluded Arkansas, Kansas, Louisiana, New Mexico, and Oklahoma for two reasons. One, the abortions reported by state of occurrence in these states likely include abortions to Texas residents. Two, as described above, residents of these states may be affected by the Texas Act.

As shown in Figure 3a, the trend in the late-term abortion rate in the 32 states was essentially unchanged over the 6 years, and the level of the rate in the 32 states was very close to the level in Texas during 2001-2003. The estimated impact of the ACS provision of the WRTK Act, using the rate in the 32 states as comparison was -0.48 abortions per 1000 ($p < 0.01$; Table 2, Panel A, column 2), or a decline of 60% as evaluated at the pre-Act mean rate of 0.79.

D. Changes in the rate of early abortions

To ascertain that the fall in the late-term abortion rate was in fact the result of the ASC requirement for late-term abortions and not the result of the mandated 24-hour waiting period, we tested the association between the WRTK Act and the early abortion rate in Texas. We defined the early abortion rate as the number of abortions at <16 weeks gestation per 1000 women of ages 15-44.

The rate of early abortion among residents of Texas varied little between 2001 and 2006, with no apparent change between 2003, the year prior to the Act and 2004, the first year after implementation (Figure 3b). The regression estimates confirm this finding. The coefficients for teens and adults, as well as all women combined are positive and insignificant, suggesting that there was no fall in the overall early abortion rate associated with the Act and confirming that the decline in the late abortion rate was entirely due to the ASC requirement. The findings are robust across the two sets of comparison states (Arkansas, Kansas, and Oklahoma vs the 32 states).

One concern is that a fall in the early abortion rate due to the mandated 24-hour waiting period is offset by a rise in the early abortion rate if women responded to the lack of late abortion services by scheduling the abortion prior to the 16th week of gestation. Abortion providers

unable to convert their facility to meet the standards of an ASC had strong incentives to encourage terminations prior to the 16-week cutoff. A plausible scenario would begin with a woman 12 to 15 weeks pregnant calling a clinic to schedule an abortion. If the provider was not an ASC, then the woman would be informed of the 15-week limit and encouraged to schedule an appointment as soon as possible.¹¹ If such behavior were prevalent, then we would observe an increase in abortions close but prior to the 16-week cutoff. While the regression estimates suggest no change in the rate of early abortions, a rise in the number of abortions performed at 15 weeks gestation may not be substantively large to effect the rate of all abortions performed at <16 weeks gestation. To evaluate whether Texas's WRTK Act was associated with a change in the rate of abortion at 15 weeks gestation, we applied the difference-in-differences estimator discussed above to the 15-week abortion rate defined as the number of abortions at 15 weeks gestation per 1000 population.

In Figure 4, we show the rate of abortions at 15 weeks gestation in Texas and the 3 neighboring states.¹² While the trend is relatively stable in the pre-Act years of 2001-2003, there is an apparent increase in the rate between 2003 and 2004 in Texas, but not in the comparison states. According to the regression estimates, the change in the 15-week abortion rate associated with the Act is 0.11 and 0.09 abortions per 1000 among teens and adults, respectively (Table 2, Panel A, column 8), both statistically significant ($p < 0.01$). The overall increase among women of all ages was 0.09 per 1000, or 28% as evaluated at the pre-Act mean of 0.32.

While we don't have data from comparison states on the number of abortions at 14 weeks gestation, a comparison of the trend of the abortion rate at 14 weeks gestation in Texas to the rate

¹¹ For instance, Whole Woman's Health with clinics Austin, McAllen and Beaumont provides what it calls "Fast Track Care" for women in "schedule constraints." See http://www.wholewomanshealth.com/baltimore/baltimore_private_abortion.html

¹² We lack data on abortions at 15-weeks gestation from the 31 states and the District of Columbia.

at 15 weeks gestation in Texas and the comparison states (also shown in Figure 4) reveals no rise in the 14-week abortion rate associated with Texas's Act.¹³ The trend in the 14-week abortion rate in Texas follows very closely the trend in the abortion rate at 15-weeks gestation in the comparison states of AR, KS, and OK, suggesting that some women seeking an abortion late in the pregnancy were able to schedule the procedure one week prior to the 16-week cutoff, but not earlier.

The rise in the abortion rate at 15-weeks gestation associated with the ASC requirement might have offset a decline in the overall early abortion rate of less than 16 weeks gestation associated with the 24-hour waiting period, if the decline in the overall rate was less than or equal to the rise in the abortion rate at 15-weeks gestation. The coefficients for the abortion rate at < 16 weeks gestation presented in Table 2 suggest that this is not the case. However, to ascertain that the rise in the 15-week abortion rate is not driving the results for the early abortion rate, we re-estimated the effect of the mandated 24-hour waiting period on the abortion rate at 14-weeks gestation or earlier, thereby excluding from the early rate abortions at 15-weeks gestation (Table 2, Panel A, column 11). The estimates remain positive and insignificant.

E. Estimated increase in the number of births

We hypothesize that women who, in the wake of the WRTK Act, were not able to schedule an abortion prior to the 16th week of pregnancy, who could not obtain a late-term abortion in a hospital, and who could not travel out of state for a late termination had no other option but to carry the pregnancy to term. Since we can account for the first three options, the difference between the expected number of abortions in absence of the WRTK Act and the

¹³ The trend of the abortion rate at 13-weeks gestation in Texas follows very closely the trend of the abortion rate at 14 weeks (figure not shown).

observed number of abortions represents an estimate of pregnancies that were likely carried to term as a result of the WRTK Act. Based on the relative decline of 50.5% (the more conservative of our two point estimates) in the abortion rate at or after 16 weeks gestation and the increase of 39.1% in the abortion rate at 15 weeks gestation, we estimate that there were conservatively 1392 fewer abortions per year in 2004-2006 than there would have been in absence of the law, or a total of 4176 fewer abortions during the 3-year period (see the Appendix for details). We suspect that most of these pregnancies resulted in unintended births; however, we lack statistical power to detect a change of this magnitude in the birth rate. The average annual change in the birth rate in Texas from 2000-2003 was 0.3 births per 1000 women ages 15-44.¹⁴ If we assume that the estimated number of 1392 unaccounted for pregnancies all resulted in births, this would lead to a change of only 0.3 births per 1000, which is indistinguishable from the average yearly variation in the birth rate in the pre-Act period.

The estimated number of 4176 births represents less than one percent of the total number of births in Texas during 2004-2006, an arguably modest increase in unwanted fertility. However, women who are poor, young and less educated take longer to recognize, decide and arrange an abortion than their less poor and better educated counterparts (Finer et al. 2006). Sixty-six percent of terminations in the second trimester have family incomes below 200 percent of the federal poverty level.¹⁵ This suggests that loss of late-term abortion services in Texas disproportionately affected disadvantaged women, and likely increased unintended childbearing among women with less resources to adjust to the change.

¹⁴ Centers for Disease Control and Prevention. National Center for Health Statistics. VitalStats. <http://www.cdc.gov/nchs/vitalstats.htm>. (accessed on February 10, 2010).

¹⁵ Personal communications with Rachel Jones based on tabulations from the Guttmacher Institute's Abortion Patient Survey in 2000.

F. Accuracy of the count of out-of-state abortions

The reliability of our estimates depends on the accuracy of the count of late term abortions obtained by residents of Texas outside the state. We are confident that we missed few of these abortions. Almost all women who left Texas for a late termination in 2004 went to a neighboring state. Of the 736 abortions by Texas residents recorded by state health departments in 9 nearby states, 726 (99%) occurred in the 5 neighboring states (Arkansas, Kansas, Louisiana, Oklahoma, and New Mexico).¹⁶ The remaining 10 abortions (1%) obtained out of state occurred in Colorado (9) and Missouri (1). Data collected from Mississippi and Tennessee indicated that there were no abortions after 15 weeks gestation by Texas residents in those states from 2004 to 2006. Given the very small number of women who traveled beyond the 5 neighboring states for a late abortion, we are confident that our results are not affected by the lack of data on abortions to residents of Texas obtained from other states.¹⁷

G. Changes in the price of abortion

To this point we have demonstrated that Texas's WRTK Act was associated with a major decrease in the number of abortions after 15 weeks to residents of Texas. If the reduction in the quantity demanded resulted from a leftward shift in the supply of late-pregnancy abortion services, then we should observe an increase in the price of these services. As a crude test, we used a simple difference-in-difference (DD) estimator to compare the change in the median

¹⁶ There were more abortions 16 weeks or more gestation to residents of Texas performed in Kansas than in Oklahoma. No clinic in Oklahoma performs abortions after 18 weeks. By contrast, Dr. Tiller's clinic in Wichita, Kansas, which is right over the border from Oklahoma, was a long-standing provider of abortions up to 24 weeks gestation until Dr. Tiller's murder in May of 2009.

¹⁷ We believe relatively few women obtained an abortion in Mexico after the enactment of WRTK Act in Texas. Abortion is illegal under most circumstances in the Mexican states along the Texas border, although the rate of illegal abortion in the country is very high (Singh, Garcia, and Olavarrieta 2008). Legal Texas residents would have little incentive to use an illegal market in a foreign country for a complicated abortion when legal abortions could be obtained in nearby states.

charge for an induced termination at 20 weeks gestation in Texas relative to the rest of the states in the US. Data are from the Guttmacher Institute's survey of abortion providers in 2001 and 2006.¹⁸ We performed a similar exercise for abortions at 10 weeks gestation. Since there was no change in the rate of abortions prior to 16 weeks gestation, we expected no change in charges at 10 weeks associated with the WRTK Act. In Table 4, we show 4 specifications: median charges in levels and in logs, weighted and un-weighted. We use the number of abortion providers in the state that reported charges as weights. The charges for an abortion at 20 weeks gestation increased about 37 percent (or about \$454) more in Texas between 2001 and 2006 relative to the other states. There was no relative increase in charges at 10 weeks gestation. Results are robust to functional form and weighting. This finding should be interpreted with caution. We used changes in Texas at only two points in time. We also assumed that the change in charges in other states accounted for all other determinants. Nevertheless, results are consistent with a supply-side shock, and the lack of a change in charges for abortions at 10 weeks provides a modest falsification test.

V. CONCLUSIONS

Recent state policies towards abortion have been targeted at the provision of abortion services. According to the major federation of abortion providers, these so called TRAP laws can greatly increase the costs of providing abortion services.¹⁹ Arguably the most costly of these provisions is that abortions of a specified gestation be performed in an ambulatory surgical

¹⁸ The Guttmacher Institute only had data on charges at 10 and 20 weeks gestation. In addition, we were not able to use provider-level data for reasons of confidentiality. Data on charges at 20 weeks gestation were only available from 38 states and the District of Columbia; however, in four states data were only available for 2001 (n=74). Data on charges at 10 weeks were available from 49 states and the District of Columbia with data from one state only available for 2001 (n=99).

¹⁹ http://www.prochoice.org/pubs_research/publications/downloads/about_abortion/trap_laws.pdf

center. Our findings from Texas suggest that the restructuring requirement proved to be a significant hurdle for abortion providers, which led to the immediate disruption of late-term abortion services in the state. Three years after the implementation of the law, abortion providers meeting the ASC requirement had opened in four major cities. Nevertheless, the number of cities with providers capable of performing abortions at 16 weeks gestation or later in a non-hospital setting was still fewer than half the pre-Act level. The lack of late-term abortion services in Texas was associated with an 88% drop in the number of late-term abortions performed in the state in the first year the law was in effect. During the same period, abortions to residents of Texas obtained out of state almost quadrupled; however, the substantial rise in late abortions obtained out of state did not offset the decline in abortions obtained in Texas. As a result, the overall late-term abortion rate of Texas residents declined 50% during 2004-2006, and 3-years after the implementation of the law was still only at 46% of the pre-Act level. Charges for second-trimester abortions increased by over \$400 (or 39%) between 2001 and 2006.

Our findings pertain to a single state, and may not generalize beyond Texas. Nevertheless, circumstances in Texas provided a unique opportunity to analyze the effect of a supply-side policy. First, the loss of abortion services after 15 weeks and the lack of alternatives within the state generated a sharp decline in availability. Second, we had access to detailed data on induced abortions in a large, populous state and thus sufficient cases to detect meaningful changes. Third, we were able to collect data on abortions to residents of Texas obtained in neighboring states and eliminate the likelihood a spurious finding due to uncounted terminations. All three factors enhanced the internal validity of the analysis.

Currently, 9 states require that abortions of a specific gestation be performed in an ASC (Center for Reproductive Rights 2007). The most recent is Missouri, whose statute requires that

any provider that performs abortions after 12 weeks gestation or terminates more than 5 pregnancies in a month at less than 12 weeks gestation must meet the standards of an ASC. The law has been temporarily enjoined.²⁰ If Missouri's law, which is substantially more restrictive than the requirements in the WRTK Act, is upheld and adopted by other states, it could have a profound effect nationally on the availability of second-trimester abortion services.

²⁰ Planned Parenthood of Kansas and Mid-Missouri, Inc. v. Drummond, Case No. 07-4164-CV-C-ODS (W.D. MI. August 27, 2007).

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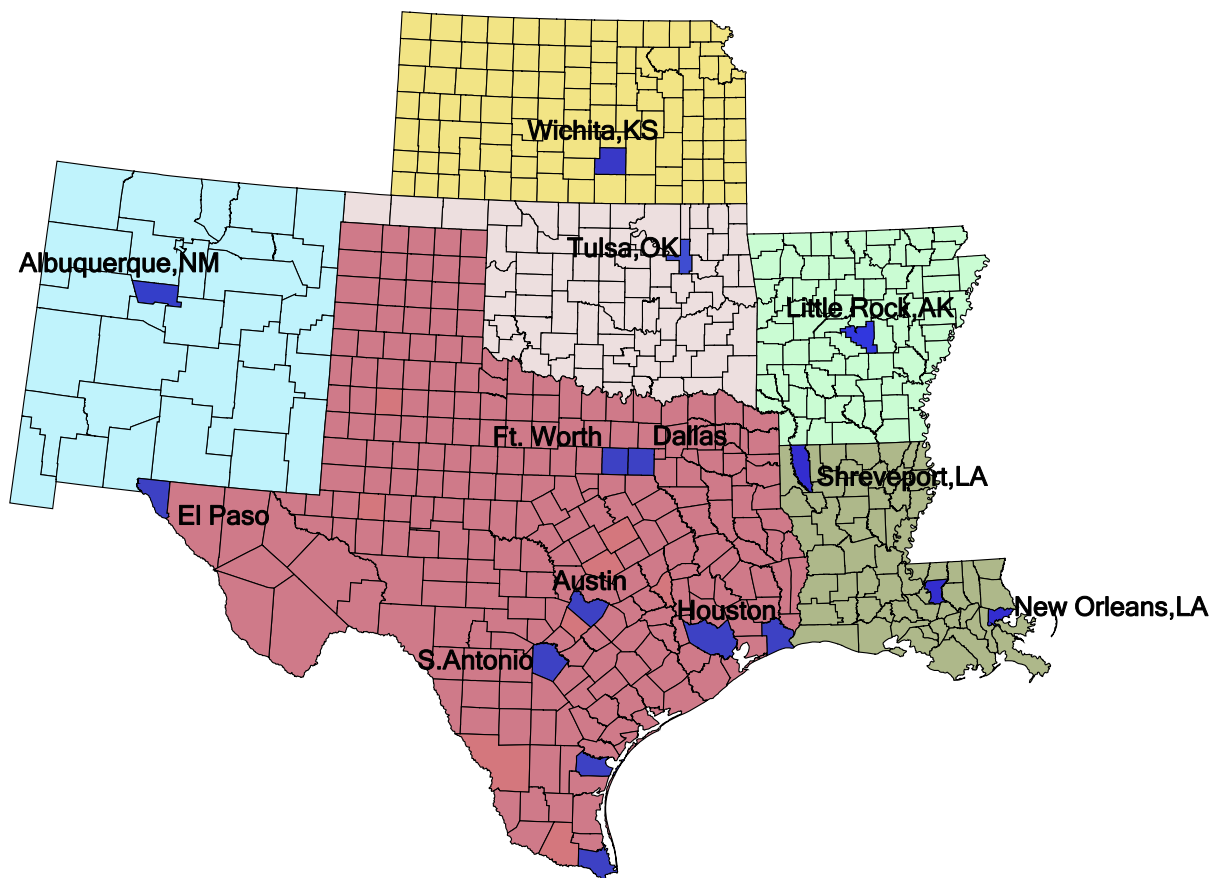
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Figure 1: Counties with Late-term Abortion Services in Texas and Nearby States, 2003



 Abortions ≥ 16 wks gestation available

Source: Authors' tabulation of induced termination files, Texas Department of State Health Services, authors' telephone survey, and Guttmacher Institute.

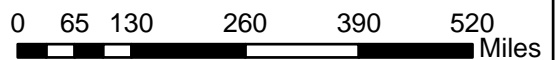


Figure 2a.
 Number of Abortions With ≥ 16 Weeks Gestation Obtained by Texas Residents in Texas and Out-of-state, by Year (2001-2006)

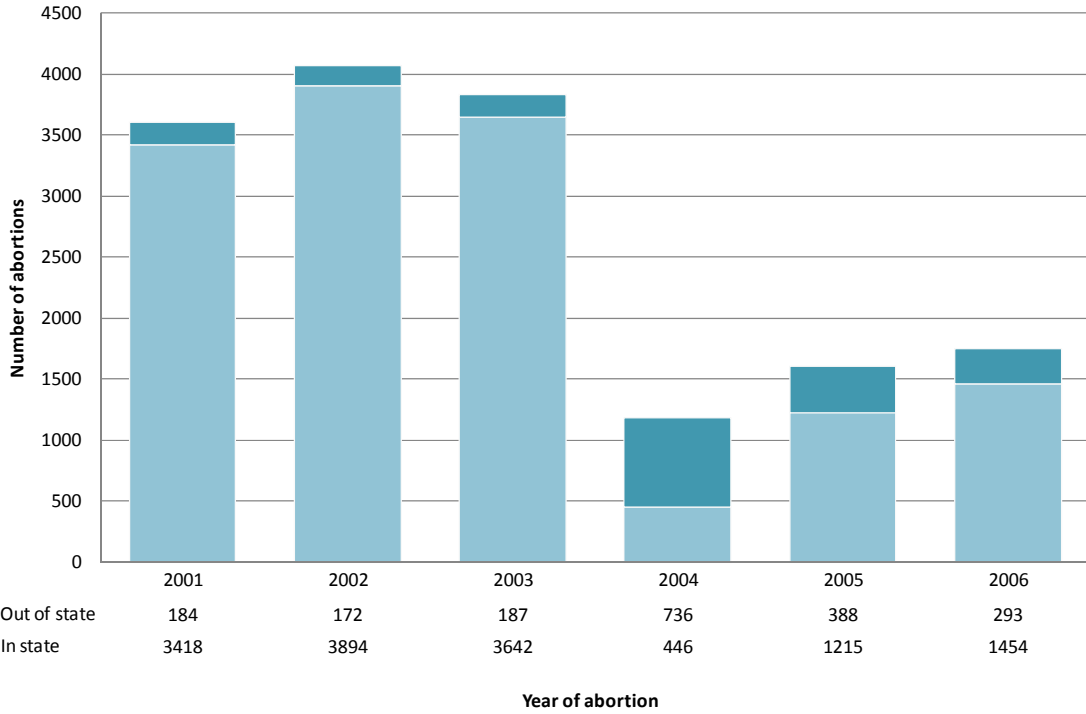


Figure 2b.
 Number of Abortions With < 16 Weeks Gestation Obtained by Texas Residents in Texas and Out-of-state, by Year (2001-2006)

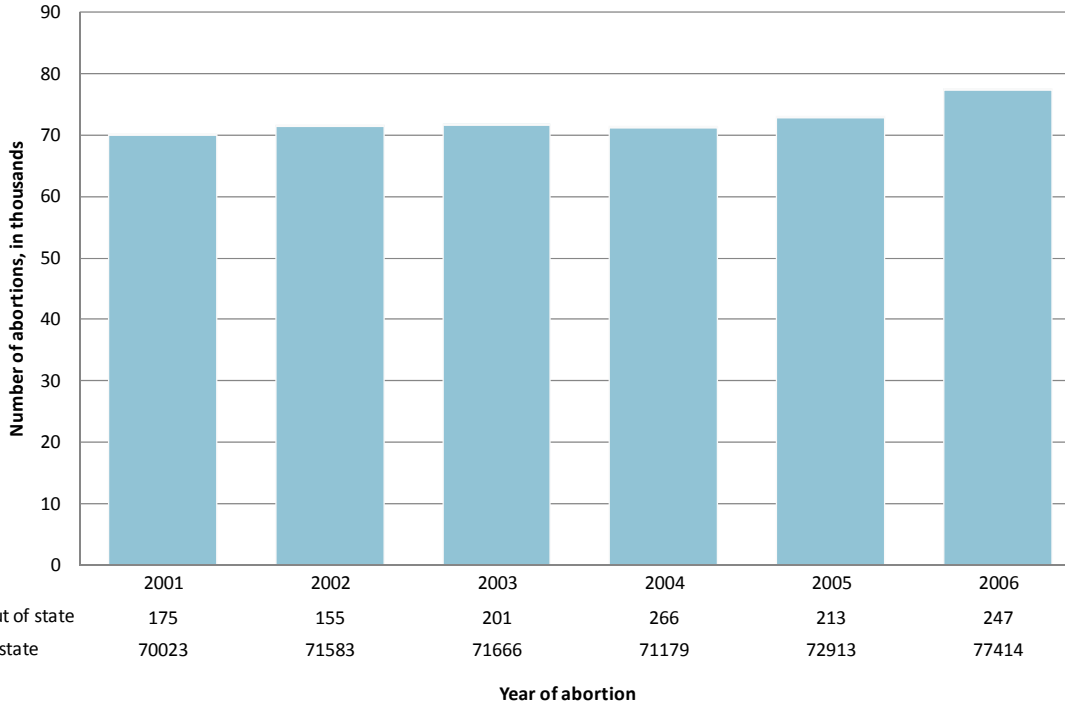
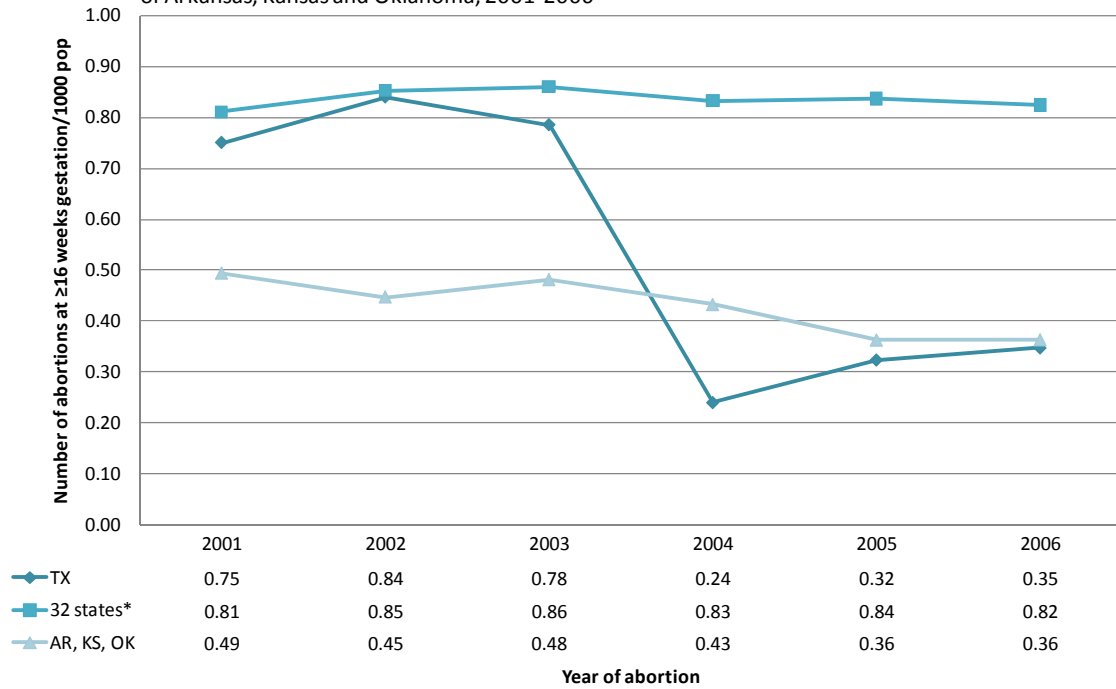


Figure 3a.

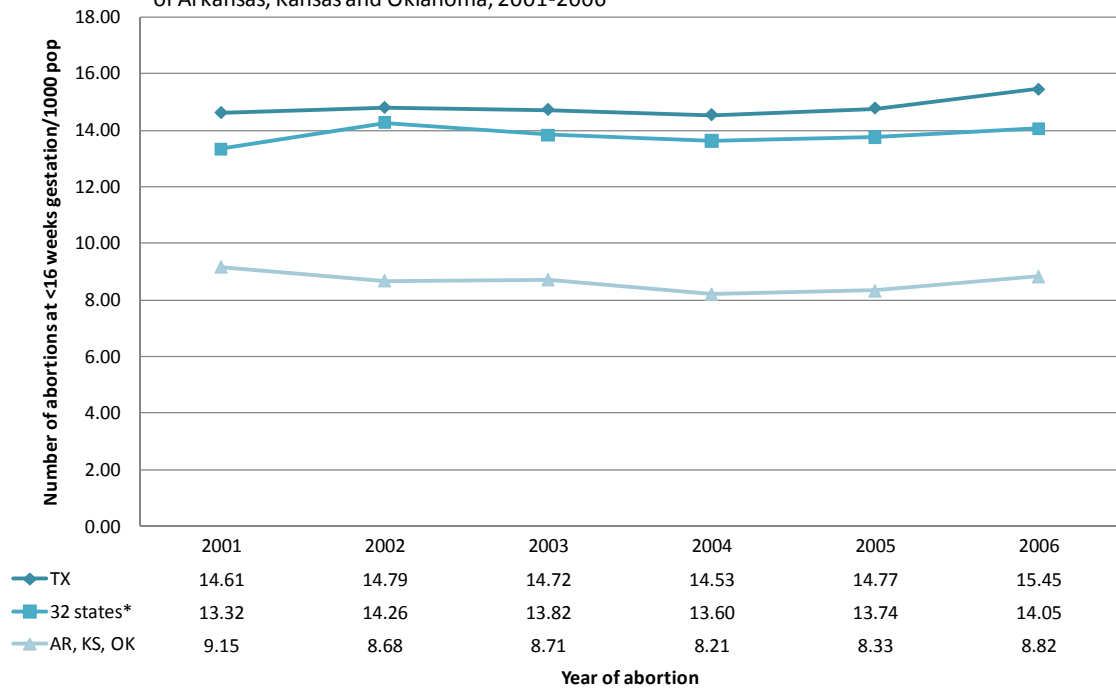
Abortion rate at ≥ 16 weeks gestation for Texas residents, residents of 32 states, and residents of Arkansas, Kansas and Oklahoma; 2001-2006



*The excluded states from the national rate are: AR,KS, NM, OK, TX, AK, LA, MI, NE, NC, WV, WY, NV.

Figure 3b.

Abortion rate at < 16 weeks gestation for Texas residents, residents of 32 states, and residents of Arkansas, Kansas and Oklahoma; 2001-2006



*The excluded states from the national rate are: AR,KS, NM, OK, TX, AK, LA, MI, NE, NC, WV, WY, NV.

Figure 4.
 Abortion rate at 15 weeks gestation for Texas residents, and residents of Arkansas,
 Kansas and Oklahoma; 2001-2006

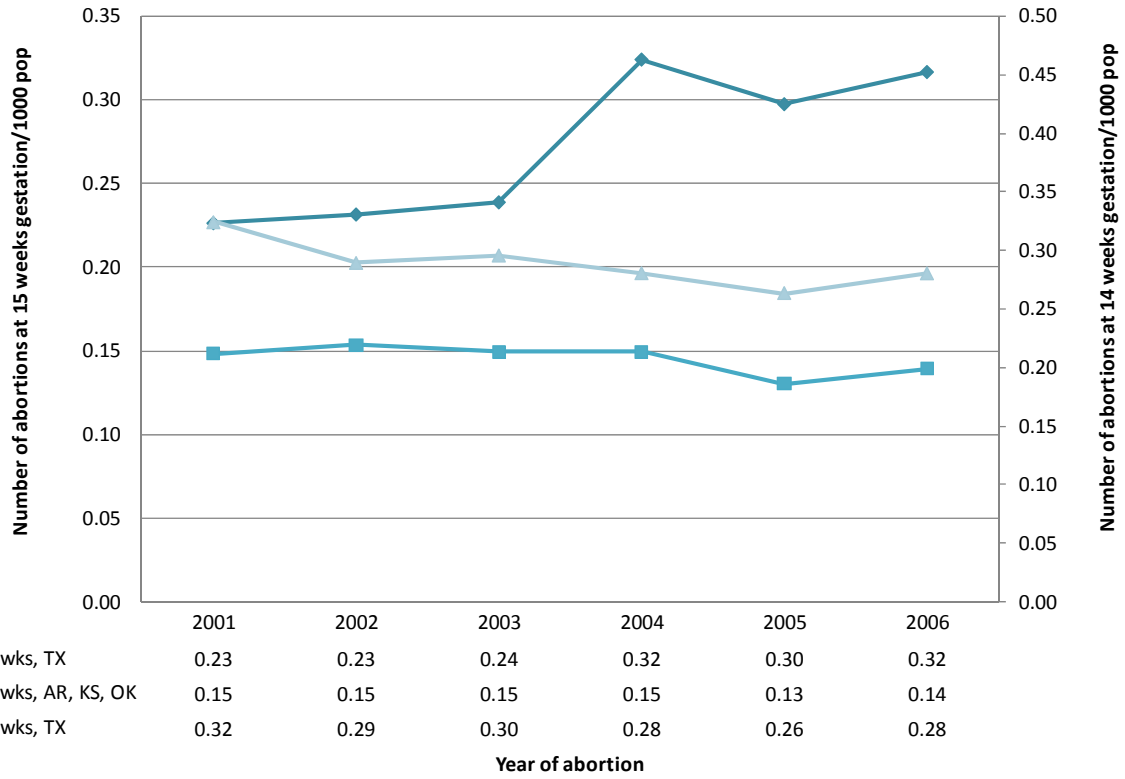


Table 1. Number of abortions to residents that occurred in Texas by length of gestation, year, type of facility and demographic characteristics^a

	<16 weeks gestation				≥16 weeks gestation			
	2001-2003		2004-2006		2001-2003		2004-2006	
	N	(%)	N	(%)	N	(%)	N	(%)
Facility:								
Clinic [£]	212,990	(99.9)	211,932	(95.7)	10,387	(94.8)	224	(7.2)
ASC	29	(0.0)	9,411	(4.2)	8	(0.1)	2,371	(76.1)
Hospital	253	(0.1)	163	(0.1)	559	(5.1)	520	(16.7)
Age:								
<20 years	37,426	(17.6)	36,864	(16.6)	2,946	(26.9)	765	(24.5)
≥20 years	172,130	(80.7)	184,300	(83.2)	7,755	(70.8)	2,349	(75.4)
Unknown	3,716	(1.7)	342	(0.2)	253	(2.3)	1	(0.0)
Race/ethnicity:								
White	74,501	(34.9)	76,054	(34.3)	3,873	(35.4)	1,135	(36.4)
Black	45,195	(21.2)	51,577	(23.3)	2,801	(25.6)	736	(23.6)
Hispanic	78,391	(36.8)	80,176	(36.2)	3,691	(33.7)	1,045	(33.5)
Other	10,288	(4.8)	11,072	(5.0)	420	(3.8)	144	(4.6)
Unknown	4,897	(2.3)	2,627	(1.2)	169	(1.5)	55	(1.8)
Marital status:								
Married	44,289	(20.8)	41,517	(18.7)	2,137	(19.5)	720	(23.1)
Unmarried	164,999	(77.4)	177,019	(79.9)	8,524	(77.8)	2,303	(73.9)
Unknown	3,984	(1.9)	2,970	(1.3)	293	(2.7)	92	(3.0)
Total	213,272	(100.0)	221,506	(100.0)	10,954	(100.0)	3,115	(100.0)

Abbreviations: ASC, ambulatory surgical center; D&E, dilation and evacuation.

^a Data by facility, age, race and marital status pertain to abortions to residents of Texas obtained in the state and do not include abortions to residents of Texas obtained outside the state.

[£] Clinic includes physicians' offices

Table 2. Changes in the Abortion Rate at ≥ 16 Weeks Gestation, < 16 Weeks Gestation and at 15 Weeks Gestation after the Woman's Right to Know Act in Texas Relative to Arkansas, Kansas, and Oklahoma; 2001-2006 (N=12)

	Abortions at ≥ 16 weeks gestation/1000			Abortions at < 16 weeks gestation/1000			Abortions at 15 weeks gestation/1000			Abortions at ≤ 14 weeks gestation/1000		
	Mean	Coef. (se)	% change	Mean	Coef. (se)	% change	Mean	Coef. (se)	% change	Mean	Coef. (se)	% change
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A - Comparison states: AR, KS, OK												
Teens	1.31	-0.66*	-50.4	15.78	0.65	4.09	0.38	0.11*	29.9	15.35	0.51	3.35
		(0.11)			(0.48)			(0.02)			(0.47)	
Adults	0.67	-0.33*	-49.7	14.19	0.86	6.03	0.20	0.09*	46.0	13.96	0.75	5.38
		(0.03)			(0.36)			(0.01)			(0.36)	
All women	0.79	-0.40*	-50.5	14.71	0.60	4.11	0.23	0.09*	39.1	14.44	0.50	3.46
		(0.04)			(0.35)			(0.01)			(0.35)	
Panel B - Comparison states: 32 states												
All women	0.79	-0.48*	-60.31	14.71	0.21	1.44	---	---	---	---	---	---
		(0.04)			(0.34)			---			---	

Each coefficient is from a separate regression. Each regression model has 12 observations. Each model includes a state indicator (Texas vs. Arkansas, Kansas, Oklahoma), indicator of the after-law period (2001-20003 vs. 2004-2006), an interaction between the state indicator and after-law period and a linear trend term. The coefficients presented in the table are the coefficients on the interaction between the state and after-law period indicators. The dependent variable is in levels in columns 2 and 5 and logs in columns (3) and (6). There are 12 observations in each regression (2 groups of states over 6 years). Standard errors are adjusted for a general form of heteroskedasticity. Rates of abortions at ≥ 16 weeks gestation for all women in Texas include abortions obtained by residents of Texas in Oklahoma, Arkansas, Kansas, New Mexico, Louisiana, Colorado, Mississippi, Missouri, and Tennessee. The rates by age exclude abortions obtained in Colorado, Mississippi, Missouri, and Tennessee. Rates for all women in both Texas and the comparison states include abortions with missing age. Mean rates of abortions at ≥ 16 , < 16 and 15 weeks gestation for Texas residents in 2001-2003 are provided in columns (1), (4) and (7), respectively. * $p < 0.01$

Table 3. Change in Charges for an Abortion at 20 and 10 Weeks Gestation in Texas Relative to the Rest of the US from 2001 to 2006

Panel A: Charges at 20 Weeks Gestation				
	Median	Ln Median	Median	Ln Median
	(1)	(2)	(3)	(4)
Coefficient	454.7*	0.369*	482.3*	0.374*
(SE)	(135.0)	(0.1)	(86.3)	(0.1)
N	74	74	74	74
Median charge 2001	\$1,188		\$1,335	
Panel B: Charges at 10 Weeks Gestation				
	Median	Ln Median	Median	Ln Median
	(1)	(2)	(3)	(4)
Coefficient	15.23	0.07	4.70	0.04
(SE)	(44.2)	(0.06)	(82.7)	(0.10)
N	99	99	99	99
Median charge 2001	\$411		\$483	
Weighted	No	No	Yes	Yes

Coefficient is β_3 from the following regression: $C_{jt} = \alpha + \beta_1 TX_j + \beta_2 Y06_t + \beta_3 (TX_j * Y06_t)$ where C_{jt} is the nominal median charge for an abortion at 20 or 10 weeks gestation in state j and year t . TX is one if charges pertain to Texas (vs. all other states) and $Y06$ is one if the year is 2006 (vs. 2001). Data are from the Guttmacher Institute's survey of abortion providers in 2001 and 2006. Standard errors are adjusted for a general form of heteroscedasticity. In the weighted regressions we use the number of abortion providers in a state

* $p < .001$