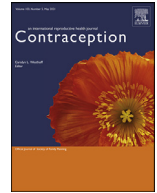




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## Original Research Article

## Border-state abortions increased for Texas residents after House Bill 2

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## ABSTRACT

**Objectives:** To assess changes in Texas-resident border-state abortions, medication abortions, and abortions  $\geq 22$  weeks from last menstrual period (LMP) before and after implementation of House Bill 2 (HB2) in November 2013 and before and after the US Supreme Court's decision regarding HB2 in June 2016.

**Study design:** We conducted an interrupted time series analysis using 2012–2017 data on Texas-resident abortions in Arkansas, Louisiana, Oklahoma, and New Mexico. Data on procedure type and gestational age were available only for abortions in New Mexico.

**Results:** Border states reported 762 Texas-resident abortions in 2012, 1,673 in 2014, and 1,475 in 2017. Texas-resident abortions in all border states nearly doubled following HB2's implementation (incidence rate ratio [IRR]=1.92, 95% CI: 1.67–2.20). Border-state abortions then decreased by 19% after the 2016 US Supreme Court decision, compared to the period prior to the decision and after HB2's implementation (IRR=0.81, 95% CI: 0.73–0.91). From 2012 to 2014, the proportion of Texas-resident abortions in New Mexico that were medication abortion increased from 5% to 20% ( $p < 0.001$ ) and the proportion that were  $\geq 22$  weeks from LMP decreased from 40% to 23% ( $p < 0.001$ ). Texas vital statistics undercounted annual out-of-state abortions, reporting only 13%–73% of abortions reported by border-state clinics during the study period.

**Conclusions:** HB2 was associated with increases in border-state abortions for Texas residents, including in the number of those  $\geq 22$  weeks from LMP. Border-state abortions declined after the Supreme Court ruled HB2 unconstitutional yet remained higher than pre-HB2 levels.

**Implications statement:** Abortion restrictions that severely curtail access may result in increases in travel out of state for care. Documenting out-of-state abortions is important for evaluating broader policy impacts and to prepare for future service disruptions. Texas residents may have more limited options for care if border states enact restrictive abortion laws.

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## 1. Introduction

In July 2013, the Texas legislature passed House Bill 2 (HB2), which included four provisions: physicians providing abortions needed hospital admitting privileges within 30 miles of the facility, abortion-providing facilities had to meet requirements of an ambulatory surgical center (ASC), most abortions at or after 20 weeks “postfertilization” (or 22 weeks since last menstrual period, LMP) were banned, and the provision of medication abortion had to follow the outdated protocol described in US Food and

Drug Administration-approved mifepristone label, which reduced the limit on gestational age to 49 days and generally required four clinic visits [1]. In April 2013, 41 facilities provided abortion care in Texas. Between July 2013, when HB2 was passed, and November 2013, when it was enforced, 19 facilities closed or stopped providing abortion [2]. By July 2014, 19 licensed Texas facilities providing abortions remained [3]. Two years later in June 2016, the US Supreme Court ruled that HB2's admitting privileges and ASC requirements were unconstitutional in *Whole Woman's Health v. Hellerstedt* [1].

After enforcement of HB2, the total number of abortions and medication abortions declined in Texas [2,4], the number and proportion of abortions occurring in the second trimester increased

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[5], and patients faced greater barriers to abortion care [3,6]. One study found an increase in the number of Texas women obtaining abortions in New Mexico [7]; otherwise, limited evidence exists about the law's impact on out-of-state abortion-seeking by Texas residents.

The present study examines changes in total abortions, medication abortions, and later abortions for Texas residents before and after HB2 in Arkansas, Louisiana, Oklahoma, and New Mexico (referred to as border-state abortions) and assesses discrepancies between out-of-state abortions reported in Texas vital statistics compared to Texas-resident abortions reported by border states.

## 2. Methods

For the period 2012–2017, we collected data on the monthly number of Texas-resident abortions from health departments in Louisiana and Oklahoma and from individual facilities in Arkansas and New Mexico, as monthly data were not available from those states' health departments. Residence was determined by the address the patient provided to the clinic when seeking services. Of the five facilities open in Louisiana during the study period, we collected data from the largest and determined that reports were comparable to those from the health department for that facility. This provided some reassurance of the accuracy of Louisiana health department data. Oklahoma's health department provided monthly numbers for the four state facilities combined, so we were not able to validate Oklahoma's health department data in the same way as we did for Louisiana. For months when fewer than five abortions occurred, the Oklahoma health department provided only quarterly estimates; we averaged across quarters to estimate monthly numbers. Data on procedure type and gestational age were available only for abortions in New Mexico, the only border state that provided abortions past HB2's 22-week limit.

Finally, we obtained annual vital statistics on Texas residents who obtained abortion care out of state from publicly available Texas Health and Human Services data [8]. Given that Texas vital statistics data are publicly available and less resource-intensive for researchers to collect and analyze, verification of their accuracy relative to border-state data on Texas residents is useful for evaluating the utility of vital statistics data for monitoring trends in out-of-state travel following abortion restrictions.

We used descriptive statistics to compare the monthly number of all border-state abortions before and after HB2 in total and by state (using data collected from border states) and to compare the annual number of out-of-state abortions reported in Texas vital statistics to those obtained from border states throughout the study period. We report the median rather than mean monthly number of abortions because these are count data, which are not normally distributed. And for each study year, we divided the number of out-of-state abortions reported in Texas vital statistics data by the number of Texas-resident abortions obtained from border states.

Using monthly count data and an interrupted time series design, we estimated negative binomial segmented regression models [9] to examine changes in the number of border-state abortions after HB2's implementation and following the US Supreme Court decision, adjusting for abortion seasonality (i.e., whether or not the abortion occurred in the first quarter of the year) [10] and linear time trends (i.e., time since policy implementation) as separate fixed effects. Model 1 assesses only changes in the number of abortions after HB2's implementation, while Model 2 assesses both changes in abortions after HB2 and following the US Supreme Court's *Whole Woman's Health* decision, which ruled the provisions in HB2 unconstitutional. Both models include the same time period: January 2012 to December 2017. To limit confounding of the time series, both models exclude data from the period between

HB2's passage and enforcement (July – October 2013), when eight clinics closed in anticipation of being unable to meet the law's requirements [2]. In sensitivity analyses, we ran identical models including data from July – October 2013 as part of the pre-HB2 period. The model coefficients can be interpreted as follows. "Baseline monthly trend (since January 2012)" represents the underlying pre-HB2 trend in monthly border-state abortions. "Implementation of House Bill 2 (November 2013 vs June 2013)" is the change in incidence of border-state abortions immediately following HB2 (November 2013) compared to immediately prior to HB2 (June 2013). "Monthly trend after implementation of HB2 (November 2013–December 2017)" represents the post-HB2 monthly trend in border-state abortions from November 2013 to December 2017. "US Supreme Court decision (July 2016 vs June 2016)" is the change in incidence of border-state abortions immediately following the Supreme Court decision (July 2016) compared to immediately prior to the decision (June 2016). "Monthly trend after US Supreme Court decision (July 2016–December 2017)" represents the trend in monthly border-state abortions after the US Supreme Court decision from July 2016 to December 2017.

Finally, we computed the change in number and proportion of Texas-resident abortions in New Mexico completed with medication abortion and at  $\geq 22$  weeks from LMP in 2014 versus 2012. We conducted analyses in Stata 15 and obtained approval from institutional review boards at the University of California, San Francisco and The University of Texas at Austin.

## 3. Results

Border states reported 762 Texas-resident abortions in 2012, 1,673 in 2014, and 1,475 in 2017 (Table 1). The median monthly number of border-state abortions increased from 61 (interquartile range [IQR]: 59–72) before HB2 to 142 (IQR: 134–168) after HB2 was enforced and before the US Supreme Court overturned portions of the law ( $p < 0.001$ ) (Fig. 1). The median monthly number of border-state abortions decreased to 121 (IQR: 113–130) after the US Supreme Court ruled that provisions of HB2 were unconstitutional ( $p < 0.001$ ). Where border-state Texas-resident abortions occurred also changed after HB2: from 2012 to 2014, the proportion of all Texas-resident border-state abortions occurring in Louisiana declined from 80% to 53% and the proportion occurring in New Mexico increased from 15% to 36% (Table 1). Each year, Texas vital statistics reported fewer out-of-state abortions than did border states, with the largest discrepancy occurring in 2012 when Texas reported just 13% of its residents' abortions in another state (Table 1).

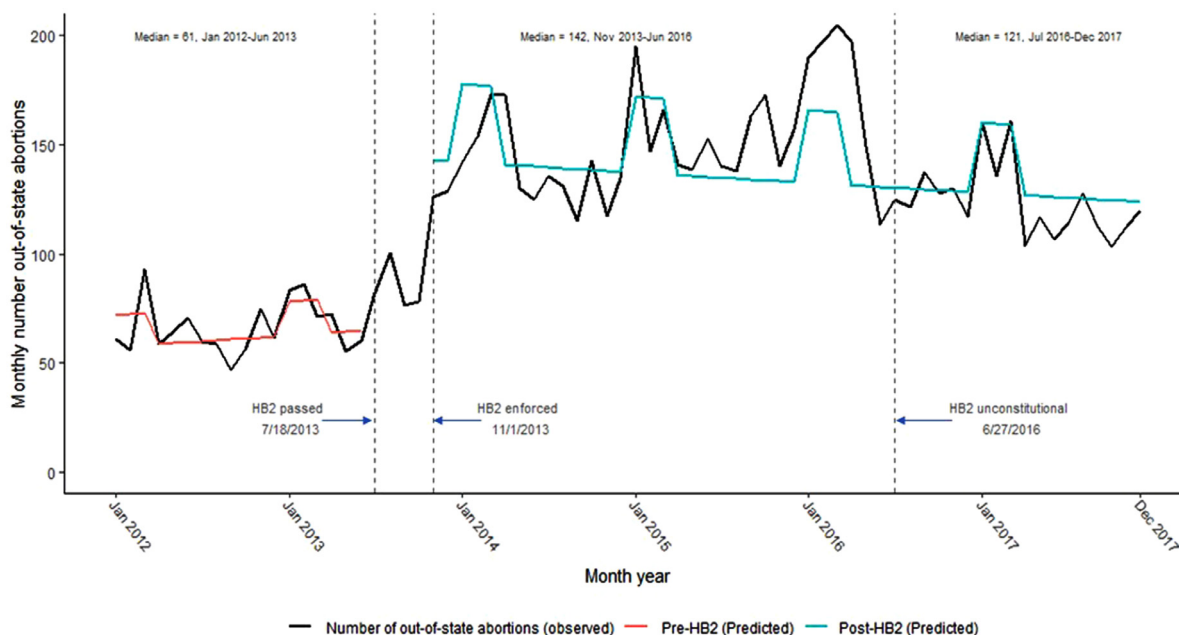
Model 1 estimates that the number of border-state abortions more than doubled immediately following HB2 (incidence rate ratio [IRR]=2.21, 95% CI: 1.94, 2.52) (Table 2). When adjusting for changes after the US Supreme Court decision, we found a nearly two-fold increase in the number of border-state abortions following HB2 (IRR=1.92, 95% CI: 1.67, 2.20) (Model 2, Table 2). After the 2016 US Supreme Court decision, border-state abortions declined (IRR=0.81, 95% CI: 0.73, 0.91) yet remained higher than pre-HB2 levels (Fig. 1). The trend in monthly border-state abortions did not change significantly during the pre-HB2 period (IRR=1.01, 95% CI: 0.99–1.02) or during the months between HB2's implementation in 2013 and the 2016 US Supreme Court decision (IRR=1.00, 95% CI: 0.99–1.02). We found similar results when including data from July to October 2013 in the models (Supplemental Table 1).

Of all Texas-resident abortions in New Mexico, the proportion completed with medication increased from 5% (6/112) in 2012 to 20% (124/607) in 2014 ( $p < 0.001$ ) and the proportion at  $\geq 22$  weeks from LMP decreased from 40% (45/112) in 2012 to 23% (138/607) in 2014 ( $p < 0.001$ , data not shown).

**Table 1**  
Number of Texas residents who obtained abortions in border states, by state and year

State (data source)	Year					
	2012 n (%)	2013 n (%)	2014 n (%)	2015 n (%)	2016 n (%)	2017 n (%)
Louisiana (Department of Health data)	607 (80)	661 (65)	886 (53)	848 (46)	888 (49)	786 (53)
Arkansas (Clinic data)	22 (3)	29 (3)	44 (3)	34 (2)	19 (1)	37 (3)
Oklahoma (Department of Health data)	21 (3)	59 (6)	136 (8)	131 (7)	107 (6)	116 (8)
New Mexico (Clinic data)	112 (15)	271 (27)	607 (36)	838 (45)	798 (44)	536 (36)
Total (Data reported by border states)	762	1020	1673	1851	1812	1475
Total (Data reported by Texas vital statistics)	97	681	754	1347	1026	566
Texas vital statistics totals as a proportion of border state totals	13%	67%	45%	73%	57%	38%

Note: The Texas legislature passed House Bill 2 in July 2013 and enforced it beginning in November 2013.



**Fig. 1.** Observed and model-predicted monthly number of abortions for Texas residents reported in Arkansas, Louisiana, New Mexico, and Oklahoma, 2012–2017. The model-predicted values are from negative binomial models that controlled for seasonality and time trends. The median monthly number of border-state abortions increased from 61 (interquartile range [IQR]: 59–72) before HB2 to 142 (IQR: 134–168) after HB2 was enforced and before the Supreme Court overturned portions of the law ( $p < 0.001$ ). The median monthly number of border-state abortions decreased to 121 (IQR: 113–130) after the Supreme Court ruled that provisions in HB2 were unconstitutional ( $p < 0.001$ ).

**4. Discussion**

The number of Texas-resident abortions in border states increased after HB2’s implementation in 2013. The increases in out-of-state abortions did not fully account for an estimated 9,230 fewer abortions in Texas in the year after HB2; abortions in Texas remained low or trended downward after that [2]. Changes in the number and type of Texas-resident border-state abortions provide additional evidence about HB2’s effects on curtailing access to Texas abortion services [3,6,11]. Our findings are consistent with prior evidence and capture a broader geographic area and time period, including the period before and after the US Supreme Court’s decision in 2016 [7].

The decline in border-state abortions after the June 2016 US Supreme Court decision may be due to an increase in number of Texas physicians providing abortions after admitting privileges were no longer required. However, numbers of border-state abortions among Texas residents remained higher through 2017 compared to pre-HB2 levels, which likely reflects limited access where Texas clinics never re-opened.

We found that Texas reported substantially fewer out-of-state Texas-resident abortions than were recorded by border states. Further, we may have underestimated the Texas undercounts of out-

of-state abortions because we compared Texas vital statistics data on all out-of-state abortions to Texas-resident abortions reported by only the four border states. The discrepancy between the data we obtained and Texas vital statistics may be due to delayed or incomplete reporting from other states to Texas officials or differences in state reporting protocols [12]. We observed similar trends in out-of-state abortions after 2014 when using both data sources (Texas vital statistics data and data obtained from border-state clinics); however, Texas’s undercount of out-of-state abortions should caution researchers who plan to use its data. Aggregated Texas vital statistics data might be useful to monitor trends in out-of-state abortions, but they do not provide an accurate count of out-of-state abortions or provide information about which specific states patients are traveling to.

We also observed a shift in where Texas residents obtained care, with a greater percentage of Texas-resident patients going to New Mexico for care after HB2. This was likely because of clinic closures in West Texas; fewer changes in the availability of services occurred in East Texas following the implementation of HB2 [6]. New Mexico was also the only border state without a mandated waiting period for abortion, so Texas residents may have sought services there in order to obtain care in a single visit [13]. Clinic closures in West Texas may also have contributed to increases in

**Table 2**  
Estimated change in number of border-state abortions among Texas residents, 2012–2017

	Model 1 (Observation months = 68) IRR (95% CI)	Model 2 (Observation months = 68) IRR (95% CI)
Baseline monthly trend (since January 2012)	1.00 (0.99–1.02)	1.01 (0.99–1.02)
Implementation of HB2 (November 2013 vs June 2013)	2.21 (1.94–2.52)	1.92 (1.67–2.20)
Monthly trend after implementation of HB2 (November 2013–December 2017)	0.99 (0.98–1.00)	1.00 (0.99–1.02)
US Supreme Court decision (July 2016 vs June 2016)		0.81 (0.73–0.91)
Monthly trend after US Supreme Court decision (July 2016–December 2017)		0.98 (0.98–0.99)

Incident rate ratios (IRR) from negative binomial segmented regression models that adjust for time trends and abortion seasonality (i.e., whether or not the abortion occurred in the first quarter of the year). Model 1 assesses changes in the number of abortions after House Bill (HB) 2's implementation in November 2013. Model 2 also assesses changes following the US Supreme Court's decision in June 2016, which ruled the provisions in HB2 unconstitutional. Both models exclude data from the period between HB2's passage and its implementation (July – October 2013). Model Ns refer to the number of months in the study period.

"Baseline monthly trend (since January 2012)" represents the underlying pre-HB2 trend in monthly border-state abortions. "Implementation of HB2 (November 2013 vs June 2013)" is the change in incidence of border-state abortions immediately following HB2 (November 2013) compared to immediately prior to HB2 (June 2013). "Monthly trend after implementation of HB2 (November 2013–December 2017)" represents the post-HB2 monthly trend in border-state abortions. "US Supreme Court decision (July 2016 vs June 2016)" is the change in incidence of border-state abortions immediately following the Supreme Court decision (July 2016) compared to immediately prior to the decision (June 2016). "Monthly trend after US Supreme Court decision (July 2016 – December 2017)" represents the trend in monthly border-state abortions after the US Supreme Court decision.

the percent of early abortions and medication abortions for Texas residents who obtained care in New Mexico after HB2. In Texas, the proportion of all abortions that were medication abortions decreased significantly after HB2's implementation [14], at a time when medication abortion as a proportion of all abortions in the US was increasing [15,16]. Given this, it is possible that people who preferred medication abortion and were past 49 days' gestation (the limit for medication abortion imposed by HB2) obtained care out of state after the implementation of HB2.

This study has several limitations. Our analyses do not include abortions for Texas residents who traveled to states farther away or changes in self-managed abortion, both of which may have increased following HB2. We were unable to measure HB2's full effect on border-state abortions due to missing data from two of New Mexico's six abortion facilities. We also did not have accessible procedure type or gestational age data from Louisiana, Oklahoma, or Arkansas, which limited our ability to investigate whether medication abortion was also common among Texas residents who had an abortion in those states. Based on geographic location, patient volume, and facility limits on gestational age, we do not believe that including data from the other New Mexico facilities would significantly change results regarding the increase in proportion of border-state abortions occurring in New Mexico after HB2 or post-HB2 increases in early abortion and medication abortion for Texas-residents in New Mexico. Finally, it is possible that other unaccounted-for factors beyond HB2, such as greater affordability of abortion outside of Texas and a lack of waiting periods in New Mexico, could at least partially explain the observed increase in Texas-resident abortions occurring in border states after HB2.

HB2 had an immediate and lasting effect on Texas-resident abortion access, leading many to cross state lines to obtain abortions. These individuals endured not only logistical barriers posed by travel and distance, but also the elevated risk of complications associated with second-trimester compared to first-trimester abortion [17,18] and financial cost [19] given that Texas prohibits abortion coverage in Medicaid and most private insurance plans. In the future, Texas residents may have more limited options for care if border states enact prohibitive laws that restrict abortion access.

#### Declaration of Competing Interest

The authors declare that they have no conflicts of interest.

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#### Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.contraception.2021.03.017.

#### References

- [1] Representative Jodie Laubenberg. Relating to the regulation of abortion procedures, providers, and facilities; providing penalties. TX HB2 2013. Available from: <https://legiscan.com/TX/text/HB2/2013/X2>.
- [2] Grossman D, Baum S, Fuentes L, White K, Hopkins K, Stevenson A, et al. Change in abortion services after implementation of a restrictive law in Texas. *Contraception* 2014;90(5):496–501.
- [3] Fuentes L, Lebenkoff S, White K, Gerdtz C, Hopkins K, Potter JE, et al. Women's experiences seeking abortion care shortly after the closure of clinics due to a restrictive law in Texas. *Contraception* 2016;93(4):292–7.
- [4] Goyal V, McLoughlin Brooks IH, Powers DA. Differences in abortion rates by race-ethnicity after implementation of a restrictive Texas abortion law. *Contraception* 2020;102(2):109–14.
- [5] White K, Baum SE, Hopkins K, Potter JE, Grossman D. Change in second-trimester abortion after implementation of a restrictive state law. *Obstet Gynecol* 2019;133(4):771–9.
- [6] Gerdtz C, Fuentes L, Grossman D, White K, Keefe-Oates B, Baum SE, et al. Impact of clinic closures on women obtaining abortion services after implementation of a restrictive law in Texas. *Am J Public Health* 2016;106(5):857–64.
- [7] Bhardwaj NR, Murray-Kreznar C, Carr S, Krashin JW, Singh RH, Gonzales AL, et al. Traveling for rights: abortion trends in New Mexico after passage of restrictive Texas legislation. *Contraception* 2020;102(2):115–18.
- [8] Texas Health and Human Services. ITOP statistics. Available from: <https://hhs.texas.gov/about-hhs/records-statistics/data-statistics/itop-statistics>. Accessed July 20, 2020.
- [9] Bernal JL, Cummins S, Gasparrini A. Interrupted time series regression for the evaluation of public health interventions: a tutorial. *Int J Epidemiol* 2017;46(1):348–55.
- [10] Parnell AM, Rodgers JL. Seasonality of induced abortion in North Carolina. *J Biosoc Sci* 1998;30(3):321–32.
- [11] Austin N, Harper S. Quantifying the impact of targeted regulation of abortion provider laws on US abortion rates: a multi-state assessment. *Contraception* 2019;100(5):374–9.
- [12] Jatlaoui TC, Boutot ME, Mandel MG, Whiteman MK, Ti A, Petersen E, et al. Abortion surveillance – United States, 2015. *MMWR Surveill Summ* 2018;67(13):1–45.

- [13] Guttmacher Institute. State laws and policies: counseling and waiting periods for abortion. 2021. <https://www.guttmacher.org/state-policy/explore/counseling-and-waiting-periods-abortion#>
- [14] Baum SE, White K, Hopkins K, Potter JE, Grossman D. Rebound of medication abortion in Texas following updated mifepristone label. *Contraception* 2019;99(5):278–80.
- [15] Jones RK, Jerman J. Abortion incidence and service availability in the United States, 2014. *Perspect Sex Reprod Health* 2017;49(1):17–27.
- [16] Jones RK, Witwer E, Jerman J. Abortion incidence and service availability in the United States, 2017, New York: Guttmacher Institute; 2019. <https://www.guttmacher.org/report/abortion-incidence-service-availability-us-2017>.
- [17] Zane S, Creanga AA, Berg CJ, Pazol K, Suchdev DB, Jamieson DJ, et al. Abortion-related mortality in the United States 1998–2010. *Obstet Gynecol* 2015;126(2):258–65.
- [18] Upadhyay UD, Desai S, Zlidar V, Weitz TA, Grossman D, Anderson P, et al. Incidence of emergency department visits and complications after abortion. *Obstet Gynecol* 2015;125(1):175–83.
- [19] Jerman J, Jones RK. Secondary measures of access to abortion services in the United States, 2011 and 2012: gestational age limits, cost, and harassment. *Womens Health Issues* 2014;24(4):e419–24.