Using Texas Birth Data to Analyze The Impact of the Texas Heartbeat Act

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Abstract

After the Texas Heartbeat Act took effect on September 1, 2021, there was a substantial reduction in the number of abortions performed in Texas. However, the impact of this law on the overall incidence of abortion has been disputed. Some have argued that the in-state decline was largely offset by Texas women either obtaining abortions in other states or obtaining chemical abortion pills through the mail. To better analyze the impact of the Heartbeat Act, I analyze its impact on the Texas birthrate seven months after it took effect. The statistically significant increase in the Texas birthrate starting in March 2022 provides solid evidence that the Heartbeat Act reduced the incidence of abortion and resulted in more pregnancies being carried to term. Furthermore, an analysis of county level data provides evidence that Texas counties located large distances from out-of-state abortion facilities experienced larger birthrate increase than other counties.

Introduction

On September 1, 2021, The Texas Heartbeat Act took effect. This prevented abortions from being performed in Texas after approximately six weeks gestation. This was the first time since *Roe v. Wade* that a law which largely prohibited abortions before the start of the third trimester was allowed to take effect. The impact of this law on the incidence of abortion has been disputed. In the months that followed the enactment of the Texas Heartbeat Law, the number of abortions performed in Texas fell dramatically. However, some have argued that the in-state decline was largely offset by either increases in Texas women obtaining abortions in other states or Texas women obtaining chemical abortion pills through the mail.

This study attempts to measure the impact of the Texas Heartbeat Law by analyzing its impact on the Texas birthrate. If the Texas Heartbeat Act succeeded in preventing abortions from taking place, there should be an increase in the Texas birthrate approximately seven months after the Heartbeat Act took effect. Furthermore, the Texas Heartbeat Act disproportionately increased the cost of obtaining an abortion for low income women and women who lived in counties long distance from the nearest out-of-state abortion facility. As such, we would expect to see larger increase in the Texas birthrate in low income counties and counties long distances away from the nearest out of state abortion facility.

Background of the Texas Heartbeat Act

Passing a law that would prevent abortions after a fetal heartbeat can be detected has been a longtime priority for many anti-abortion Texas state legislators. In 2013, a six-week abortion ban, HB 59, was introduced by state representative Phil King.[i] That bill did not pass. In 2019, another six-week abortion ban, HB 1500. was jointly introduced by state representatives Briscoe Cain, Phil King, Dan Flynn, Tan Parker, and Rick Miller.[ii] HB 1500 was sponsored or cosponsored by at least 57 of the 150 members of the Texas House of Representatives.[iii] However, like HB 59, HB 1500 failed to pass.[iv]

On March 11, 2021, the Texas Heartbeat bill, SB8, was introduced by State Senator Bryan Hughes.[v] The next day, a companion bill, HB 1515, was filed by State Representative Shelby Slawson in the Texas House of Representatives.[vi] SB 8 was reported favorably by the Senate State Affairs Committee in March by a 7-2 margin[vii] and HB 1515 was reported favorably by the House Public Health Committee in April by a 6-4 margin.[viii] HB 1515 passed the Texas State House on May 6th[ix] and SB 8 passed the Texas State Senate on May 13th.[x] Texas Governor Greg Abbott signed the Texas Heartbeat Act into law on April 19, 2021.[xi]

The Texas Heartbeat Act successfully withstood several legal challenges from plaintiffs including abortion facilities, organizations supporting legal abortion, and the U.S. Department of Justice.[xii] The enacted law took effect September 1, 2021.[xiii] This was the first time since the Supreme Court's 1973

Roe v. Wade decision that a law preventing abortion before the start of the third trimester was in effect for an extended period of time.

Impact of the Texas Heartbeat Act

In the months following the law's enactment, there was a notable reduction in the number of abortions performed in the Lone Star State. Between August 2021 and September 2021, the number of abortions in Texas declined by 3,455 (Figure 1).[xiv] Overall, in the five months after the enforcement of the Texas Heartbeat Act, the average monthly number of abortions performed in Texas declined by more than 2,760 (Table 1). This is a reduction of approximately 53 percent.

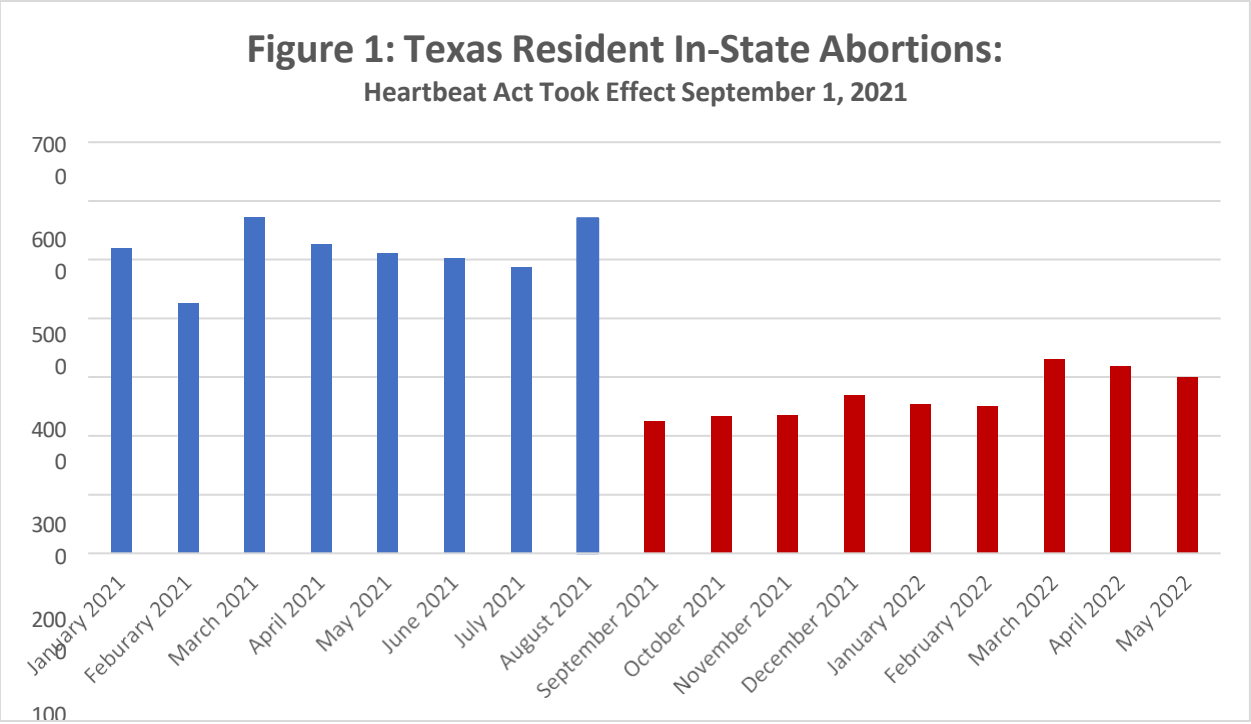

Table 1: Impact of The Heartbeat Act on The Number of Abortions Performed on Residents in Texas

Time Period	**Average Number of Abortions**
5 Months before Heartbeat Act (April 2021-August 2021)	5194.0
5 Months after Heartbeat Act (September 2021 – January 2022)	2433.8
Difference	2760.2

Note: Data obtained from Texas Department of State Health Services

The Texas Department of State Health Services reported September 2021 abortion data from Texas in early 2022.[xv] This received a significant amount of attention from journalists and commentators.[xvi] Some media outlets were skeptical that the Texas Heartbeat Act was having a large impact on the incidence of abortion. Since abortion was still legal after six weeks gestation in adjacent states after September 2021, some speculated that many Texas women were simply obtaining abortions elsewhere.

A November 2022 study published in the *Journal of the American Medical Association* found evidence of this.[xvii] The study found statistically significant declines in abortions performed in Texas after the Texas Heartbeat Act took effect. It also found statistically significant increases in the number of out-of-state abortions among Texas residents after the enactment of the Texas Heartbeat Act. The in-state abortion decline exceeded the out-of-state increase. However, the authors acknowledged that they were unable to obtain abortion data from some abortion facilities in adjacent states. They also acknowledged that

some Texas women may have obtained abortions in non-adjacent states or obtained chemical abortion pills online.

An analysis that ran in "The Upshot" section of *The New York Times* on March 6, 2022 had similar findings. The authors found that after the Heartbeat Act took effect, there was a large decline in abortions performed in Texas. However, the analysis and the accompanying graphic indicated that a high percentage of Texas' in-state abortion decline was offset by both increases in Texas women obtaining abortions in nearby states and online requests for chemical abortion pills from Aid Access, an overseas entity that sends abortion pills through the mail.[xviii1]

That said, *Times'* analysis had some limitations. First, the out-of-state abortion numbers were self-reported by abortion facilities in other states. As such, there was no way to verify the accuracy of this data. Furthermore, simply because chemical abortion pills were ordered does not mean a chemical abortion was obtained. Some women who ordered chemical abortion pills online may have changed their mind about obtaining an abortion after the pills were delivered. Additionally, media reports that indicated that some women who ordered chemical abortion pills online did so for future use.

However, since abortion was still legal in other states in late 2021 and early 2022, and since there were numerous media reports of Texas women obtaining abortions elsewhere,[xix] that made it difficult to gauge the impact of the Texas Heartbeat Act. However, an alternative way to analyze the impact of the Texas Heartbeat Act would be to analyze the available birth data from Texas. If there is an increase in the number of children being born in Texas, that would provide evidence that the Texas Heartbeat Act is preventing abortions from taking place.

Literature Review

Most of the research that has analyzed the impact of anti-abortion laws has a looked at their impact on in-state abortion rates. There is a body of research which shows that limits on Medicaid funding for abortions result in statistically significant reductions in in-state abortion rates for adults (Hansen 1980; Haas Wilson 1993, 1997; Meier and McFarlane 1994; Blank 1996; Meier et al. 1996; Levine, Trainor, and Zimmerman 1996; Matthews, Ribar, and Wilhelm 1997; Medoff 2007; Trussell et al. 1980; Korenbrot, Brindis, and Priddy 1990; New 2011; New 2014) and teenagers (Lundberg and Plotnick 1990; Haas Wilson; 1996; Medoff 1999, 2007).

There is also a body of research that which finds that anti-abortion parental involvement laws reduce in-state minor abortion rates. This is true for studies that used a times series cross sectional approach (Haas Wilson 1993, 1996; Levine 2003; Medoff 2007; New 2007, 2009, 2011; Ohsfeldt and Gohman 1994; Tomal 1999). and studies that specifically analyzed individual states Ellertson 1997; Donovan 1983; Cartoof and Klerman 1986; Donovan 1983; Ellertson 1997; Rogers et al. 1991; Henshaw 1995,

Joyce and Kaestner 2001; Ellertson 1997; Pierson 1995; Joyce and Kaestner 1996, 2001; Joyce and Kaestner 1996; Joyce, Kaestner, and Colman 2006; Colman, Joyce, and Kaestner 2008).

Similarly, there is also research which finds that anti-abortion informed consent laws lower in-state abortion rates. There are studies that have analyzed informed consent laws using a time series-cross sectional approach (New 2011; New 2014). There are also three studies which found that a Mississippi informed consent law which took effect in 1993 also lowered abortion rates (Althaus and Henshaw 1994; Joyce, Henshaw, and Skatrud 1997; Joyce and Kaestner 2000).

That said, there are some studies which have measured the impact of anti-abortion laws by analyzing their impact on birthrates. Cartoof and Klerman (1986) found a small increase in the Massachusetts minor birthrate in months after the Massachusetts pro-life parental consent law took effect in 1981.[xx] Similarly, Joyce, Kaestner, and Colman (2006) found a short-term increase in the minor birth rate in the months after the Texas pro-life parental notification law took effect in 2000.[xxi] Both of these studies provided statistical evidence that parental involvement laws in Texas and Massachusetts resulted in some minor girls carrying pregnancies to term instead of obtaining abortions.

Additionally, separate studies have analyzed Medicaid programs in Texas,[xxii] Ohio,[xxiii] and Illinois[xxiv] -- each of which ceased covering elective abortions at various points in the late 1970s. Each study found that in the months after the policy change, there was an increase in the state Medicaid birth rate anywhere from 11 to 15 percent. All of these studies provide strong statistical evidence that pregnancies are more likely to be carried to term after anti-abortion laws were enforced.

Similarly, Cook et al. (1999) used birth data to analyze the impact of public funding provisions for abortion in North Carolina.[xxv] The state fund that would pay for abortions for low-income women in North Carolina would periodically run out of money. Cook et al. found that after these funding cutoffs, the state abortion rate would decrease and the state birth rate would increase. Furthermore, these trends were more pronounced among African American women. This study provides very strong statistical evidence that limits on taxpayer funding of elective abortions reduces the incidence of abortion.

Overall, other research has analyzed how parental involvement laws and Medicaid funding limits impact birthrates. However, an analysis of Texas Heartbeat Law has the ability to make a nice contribution to this literature. It gives researchers a unique opportunity to gage how the enforcement of a gestational age limit impacts state and county birthrates.

Hypotheses

I am going to make four hypotheses about how the Texas Heartbeat Act will affect the Texas birthrate.

Hypothesis 1: The Texas Heartbeat Act Will Increase The Texas Birthrate

The enactment of the Texas Heartbeat Act increases the economic cost of obtaining abortion after six weeks gestation. Approximately 59.9 percent of abortions performed in Texas prior to the enforcement of the Heartbeat Act took place after six weeks gestation (Centers for Disease Control, 2022). As such a significant number of women considering abortion will instead carry pregnancies to term.

Hypothesis 2: The Texas Heartbeat Act Will Result in Larger Birthrate Increases in Low Income Texas Counties

Women living in low income Texas Counties will be less able than women living in high income Texas counties to absorb the increased economic costs of obtaining an abortion after six weeks gestation. As such, low income Texas counties will experience larger birthrate increases than high income Texas counties.

Hypothesis 3: The Texas Heartbeat Act Will Result in Larger Birthrate Increases in Texas Counties Where A Relatively High Percentage of Women of Childbearing Age Are Either African American or Hispanic

African American women and Hispanic Women on average earn less money than their White and Asian American counterparts. As such, they will likely have a more difficult time absorbing the increased economic costs of obtaining an abortion after 6 weeks gestation. As such, Texas counties where a relatively high percentage of women are either Black or Hispanic will experience larger birthrate increases than other Texas counties.

Hypothesis 4: The Texas Heartbeat Act Will Result in Larger Birthrate Increases in Texas Counties That Are Long Distances From the Nearest Out-of-State Abortion Facility

After the enforcement of The Heartbeat Act, Texas women seeking abortions after six weeks gestation can legally do so in other states. The economic costs of obtaining an abortion after six weeks gestation are greater for Texas women who live far away from the nearest out-of-state abortion facility. As such, I would expect larger birthrate increases in Texas counties that are long distances away from the nearest out-of-state abortion facility.

Preliminary Analysis

Raw birth data from The Texas Department of State Health Services provides evidence that the Heartbeat Act increased the number of children being born in Texas. The Texas Heartbeat Act took effect September, 1, 2021. Since 80 percent of abortions take place before 9 weeks gestation and since 83 percent of pregnancies last between 37 weeks and 40 weeks, I would expect the Texas Heartbeat Act to start having a substantial impact on the Texas birthrate starting in March 2022.

Table 2 presents March-November Texas birth data for the years 2019 to 2022. Table 3 compares 2022 to the other years. The results indicate that between March and November of 2022 the number of births increased by 2.9 percent when compared to the same time period in 2022. When 2022 March to November births are compared to the three year average of March November birth for the previous three years, there was a 3.7 percent increase. This data provides evidence that there were more births in Texas as a result of the Texas Heartbeat Act.

I will continue this analysis using monthly county level birth data. Monthly county data will allow for the analysis of more data. County level data will allow for a more rigorous analysis of the Heartbeat Act . Specifically county data will allow us to see if low income Texas counties experienced larger birthrate increases than high income Texas counties. It will allow us to see if counties with relatively high percentages of African American and Hispanic women experienced larger birthrate increases. Finally, it will also allow us to see if counties far away from the nearest out-of-state abortion facility experienced above average birth rate increases.

Table 2 about here

Table 3 about here

Methodology

I obtained county birth data for every month from January 2019 to November 2022 from the Texas Department of State Health Services. For privacy reasons, the Texas Department of State Health Services does not release monthly data for those counties where fewer than 10 births take place. For this analysis, I only analyzed data from those Texas counties where I had birth data for all 47 months from January 2019 to November 2022. That means I was able to analyze data from 122 of the 254 Texas Counties. The birthrate for each county was calculated by using birth data from the Department of State Health Services population data obtained from the U.S. Census Bureau.

Since many factors can affect the birthrate, regression analysis is well suited for this analysis. All of the regressions are run on a set of two dependent variables. The first dependent variable is the country birthrate. The second dependent variable is the logged county birthrate. Using a logged dependent variable reduces the impact of statistical outliers and allows us to measure the impact of the independent variables in percentage terms.

The independent variable that is of most interest is *Heartbeat* which gages the impact of the Heartbeat Act. The Texas heartbeat law took effect on September 1, 2021. Data from the Centers for Disease Control and Prevention (CDC) indicates that about 80 percent of abortions take place within the first 9 weeks of gestation.[xxvi] According to data from the CDC, 83 percent of live births occur between 37 and 40 weeks of pregnancy.[xxvii] That means the Texas Heartbeat Act would start to have a significant impact on Texas births about 28 weeks after its September 1, 2021 enforcement date – which would have been mid-March 2022. As such the variable Heartbeat is an indicator variable that is scored a one for every month from March 2022 to November 2022. It is scored a zero for all other months.

Data is analyzed using a weighted least squares regression, where the data is weighted by the county population of women of childbearing age (15-44) [2] Since, there are typically monthly fluctuations in the number of births that take place, monthly indicator variables are included in the regression analysis. County fixed effects variables are included as well. Finally, an annual trend variable is also included in the model. Birth data from both McLellan Country and Maverick County were excluded because they were statistical outliers The results of the first set of regressions appear in Table 4.

Table 4 About Here

The results from Table 4 provide statistical evidence that the Texas Heartbeat Act resulted in a modest but statistically significant increase in the Texas birthrate. Model 1 indicates that the Heartbeat Act increased the birthrate by approximately 0.2 births for every 1,000 Texas women of childbearing age. During the time studied, the Texas Birthrate was approximately 6.38 per thousand women of childbearing age. This would reflect an increase in the Texas birthrate of approximately 3.2 percent. Considering that approximately 6 million women of childbearing age live in Texas, that means the Texas Heartbeat Act resulted in about 1,200 more births every month. This is broadly consistent with other research analyzing the impact of the Texas Heartbeat Act on the state birthrate.

Model 2 analyzes the impacted of the Texas Heartbeat Act on the logged birthrate. It finds the Texas Heartbeat Act increased the Texas birthrate by approximately 3.5 percent. All of this is consistent with the data presented in Table 2 and adds to a body of research that shows that various abortion restrictions result in short-term birthrate increases.

Texas is a large and diverse state. It seems likely that the Texas Heartbeat Act would have a larger impact on the birthrates of certain counties. My second hypothesis is that the Texas Heartbeat Act would result in larger birthrate increases in 1) low income counties and 2) counties with high poverty rates. After the Texas Heartbeat Act took effect, Texas women seeking abortions after six weeks gestation could still

obtain abortions in other states. However, travelling to another state increases the economic cost of obtaining an abortion. I would expect that low income women would be more sensitive to the increased costs of obtaining and abortion and would be statistically more likely to carry unintended pregnancies to term after the Texas Heartbeat Act took effect.

Data on county per capita income is obtained from the Bureau of Economic Analysis and county poverty rate data is obtained from the U.S. Census Bureau. A variable interacting the Heartbeat Act with logged per capita income is added to the regression model. The results of the regressions can be found in Table 5. Another variable interacting the Heartbeat Act with the county poverty rate. It is included in another set of regressions. The results of these regressions can be found in Table 6.

Table 5 about here

Table 6 about here

The regression results from Table 5 and 6 are inconsistent with my expectations. In Table 5 the coefficient for the interaction between the Heartbeat Act and logged per capita personal income is positive and fails to achieve conventional standards of statistical significance in both regressions. Additionally in Table 6 the coefficient for the variable interacting the Heartbeat Act and the county poverty rate is both negative and achieves statistical significance in both regressions. This provides statistical evidence that the Texas Heartbeat Act resulted in larger birthrate increase in Texas counties with low poverty rates.

This was inconsistent with my expectations as I would expect the increased economic costs involved with obtaining an abortion to have a greater impact on women living in low-income counties. That said, some low-income Texas counties are near the Mexico border and it is possible that women obtained abortions in Mexico. Also, some research shows that low-income women are more likely than high income women to carry unintended pregnancies to term. As such. that might have muted the impact of the Texas Heartbeat Act in low income counties. Finally, countywide economic data might not accurately reflect the economic situation of women residing in these counties facing unintended pregnancies.

My third hypothesis is that the Texas Heartbeat Act would result in larger birthrate increase in Texas counties where a relatively large percentage of women of childbearing age were either African American or Hispanic. African American women and Hispanic women are likely to earn below average incomes. Similarly, they are likely to be part of family units with a below average household income. As such, African American women and Hispanic women might be more sensitive to the increased cost of

an abortion after the Heartbeat Act took effect and as such, might be more likely to carry unintended pregnancies to term.

County data on the percentage of women of childbearing age who are of Hispanic ethnicity was obtained from CDC Wonder. Similarly, data on the percentage of women who are of childbearing age who are African American was also obtained from CDC Wonder. Table 7 presents the results of a regression where the percentage of women of childbearing age who are Hispanic is interacted with the Heartbeat Act variable. Table 8 presents the results of regressions where the percentage of women of childbearing age who are African American is interacted with the Heartbeat Act indicator variable.

Table 7 About Here

Table 8 About Here

The results from Table 7 are broadly consistent with my hypothesis. When percentage Hispanic is interacted with the Heartbeat Act variable, the coefficient is positive in both regressions. When the country birthrate is the dependent variable the coefficient is significant at the .10 level and when the logged county birthrate is the dependent variable the coefficient is significant at the .05 level. This shows that counties where Hispanics constitute a relatively percentage of women of childbearing age had higher birthrate increases than other counties. This is consistent with some previous research.

Conversely, the results form Table 7 are inconsistent with my hypothesis. When percentage African American is interacted with the Heartbeat Act variable the coefficient is negative and statistically significant in both regressions. This shows that counties where African American women constitute a relatively large percentage of women of childbearing age had below average birthrate increases. However, it is important to note that only about 10 percent of women of childbearing age in Texas are African American. As such, this variable may not provide much insights about how African American women in Texas resolved unintended pregnancies after the Texas Heartbeat Act took effect.

My fourth hypothesis is that the Texas Heartbeat Act would result in larger birthrate increases in Texas counties located far away from the nearest abortion facility. After the Texas Heartbeat Act took effect in September 2021, Texas women seeking abortion after 6 weeks gestation could still obtain abortions in other states. After September 2021, the cities nearest to Texas where women could obtain legal abortions after six weeks gestation included Shreveport, LA, Oklahoma City, OK, Santa Teresa, NM, and Albuquerque, NM. For each Texas county, I calculated the logged distance in miles between that county and the nearest U.S. city outside of Texas with an abortion facility. I then created a variable where I interacted this distance variable with the Texas Heartbeat Act variable. The results can be found in Table 9.

Table 9 about here

Here the results are consistent with my hypothesis. Both regression models provide very strong statistical evidence that counties located far away from the nearest U.S. City outside of Texas with an abortion facility had statistically larger birthrate increases. In both regressions the independent variable interacting distance with the Heartbeat Act was positive and statistically significant. When the county birthrate was the dependent variable the interaction term was significant at the .01 level. When the logged county birthrate was the dependent variable, the interaction term was significant at the .05 level.

This provides strong statistical evidence that the Heartbeat Act disproportionately increased the costs of obtaining an abortion for Texas women who lived long distances away from the nearest out of state abortion facility. As such, after the Texas Heartbeat Act took effect, women in these counties were more likely to carry unintended pregnancies to term. To finish the analysis, I will run another set of regressions. In these regressions, I will include both the Hispanic*heartbeat interaction variable from Table 7 and the distance*heartbeat interaction variable from table 9. The regression results can be found in Table 10.

Table 10 about here

The results in Table 10 indicate that the above average birthrate increase in Texas counties with a large Hispanic population appear due to their long distance to out-of-state abortion facilities. In model 1, the coefficient for the distance interaction variable is still statistically significant, while the coefficient for the Hispanic interaction variable is smaller and is no longer statistically significant. Interestingly, in model 2 when the logged birthrate is the dependent variable, the results are somewhat different. The coefficients of both interaction terms are positive, but neither achieves conventional levels of statistical significance. Overall, based on the results of model 1, it appears that distance to the nearest out-of-state abortion facility strongly correlates with county birthrate fluctuations. The ethnic breakdown of women of childbearing age appears to have far less correlation.

Discussion

The regression results presented in Tables 4-10 provide insights about how the Texas Heartbeat Act impacted the pregnancy resolution decisions of Texas women. The results indicate that the Texas Heartbeat Act increased the Texas birthrate by between 3 and 3.5 percent. This finding was statistically significant and might be more substantively important than many might realize. Despite consistent population increases, the number of births to Texas women actually declined between 2015 and 2020. These results provide evidence that the Texas Heartbeat Act is resulting in more pregnancies being carried to term.

Contrary to my expectations it did not appear that the Heartbeat Act resulted in larger birthrate increases in low income counties. When the log of per capita income was interacted with the Heartbeat variable, the coefficient failed to achieve statistical significance. This was true both the regression where the birthrate was the dependent variable and the regression where the logged birthrate was the dependent variable. Interestingly, it appeared the Heartbeat Act resulted in *smaller* birthrate increases in counties with high poverty rates. When the county poverty rate was interacted indicator variable for the Heartbeat Act, the coefficient was negative and achieved conventional standards of statistical significance (Table 6).

There are several reasons why the Heartbeat Act might not have resulted in statistically larger birthrate increases in low income and high poverty counties. Some research indicates that low income women are statistically more likely than high income women to carry unintended pregnancies to term. Some Texas counties with below average incomes and high poverty rates are located near the Mexico border and it is possible that Texas women residing in low income counties obtained abortions in Mexico. Finally, countywide poverty rate and income data may not accurately reflect the economic situation of women in those counties facing unintended pregnancies.

The regression results also provide evidence that counties where a relatively high percentage of women of childbearing age are Hispanic had above average birthrate increases. This is consistent with some previous research. That said, when a distance variable was included, the coefficient for the Hispanic variable became smaller and lost statistical significance. As such increases in Hispanic birthrates after the enactment of the Heartbeat Act are largely due to the fact that Hispanic women are more likely to life far away from out-of-state abortion facilities. It does not appear to be largely due to economic or cultural factors.

The most interesting finding from the regressions on the county birth data is that there is strong statistical evidence that the Texas Heartbeat Act resulted in larger birthrates increases in counties located long distances from the nearest abortion facility. The interaction term for Heartbeat Act and the logged distance to the nearest abortion facility was positive and statistically significant at the .001 level in both regressions.

These findings are unsurprising. The Heartbeat Act would have only marginally increased the cost of obtaining an abortion for women living in Texas counties near an abortion facility in another state. It would have substantially increased the economic costs of obtaining abortion for Texas women living a

considerable distance from the nearest abortion facility. For some Texas women, the nearest U.S. abortion facility was located over 500 miles away. It is also consistent with previous research that when states restriction, abortion rates fall by larger amounts in counties located father away from adjacent states or cities in adjacent states with abortion facilities.

Overall, this preliminary analysis of the Texas Heartbeat Act provides solid statistical evidence that it increased the Texas birthrate and the birthrate increase was higher in counties located long distances from the nearest abortion facility. However, there are several ways this research could be expanded. Proximity to the Mexican border could also be analyzed. It is possible that some women facing unintended pregnancies obtained abortions in Mexico. Finally, county birthrate data was analyzed using a Weighted Least Squares regression model. In future research, data will be analyzed with proper corrections for time series cross sectional data.

Conclusion

This paper analyzed 47 months of county level birth data from Texas to gage the impact of the Texas Heartbeat Act. The results indicated that the Texas Heartbeat Act increased the Texas birth rate approximately 3.5 percent and resulted in approximately 1,200 more children being born every month. This is consistent with a body of previous research that shows abortion restrictions lower the incidence of abortion and result in short term increases in birthrates.

The results indicate that the Heartbeat Act's impact on the birthrate was fairly similar in high income counties as low income counties. Additionally, there was statistical evidence that the Heartbeat Act may have resulted in larger birthrate increases in counties with low poverty rates. All of this is inconsistent with my hypothesis. I would expect that cost involved with travelling to a nearby state would pose more of a burden on low income women than high income women. That said countywide economic data may not be reflective of the economic circumstances of individual women facing unintended pregnancies.

The most important finding is that Heartbeat Act had a larger impact on the birthrate in Texas counties that were located farther away from the nearest abortion facility. This is consistent with my hypothesis. The Heartbeat Act disproportionately increased the economic cost of obtaining an abortion in women living far away from abortion facilities. As such, it is unsurprising that a woman facing an unintended pregnancy would be more likely to carry that pregnancy to term if she lived a considerable distance from the nearest abortion facility.

[i] Culp-Ressler T. "Texas Legislators File Radical 'Fetal Heartbeat' Bill To Ban Abortion After Just Six Weeks." *ThinkProgress.com*, July 18, 2013. https://archive.thinkprogress.org/texas-legislators-file-radical-fetal-heartbeat-bill-to-ban-abortion-after-just-six-weeks-e641c8c7cbd1/ (October 27, 2022).

[ii] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=86R&Bill=HB1500 (October 27, 2022).
[iii] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=86R&Bill=HB1500 (November 4, 2022).
[iv] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=86R&Bill=HB1500 (October 27, 2022).
[v] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=87R&Bill=SB8 (October 27, 2022).
[vi] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=87R&Bill=HB1515 (October 27, 2022).
[vii] Texas Legislature Online. https://capitol.texas.gov/BillLookup/History.aspx?LegSess=87R&Bill=SB8 (October 27, 2022).
[viii] Ibid.
[ix] Ibid.
[x] Ibid.
[xi] Ibid.
[xii] Barret D and Marimow AE. "Justice Department Sues Texas To Block Six-Week Abortion Ban." *The Washington Post*, September 10, 2021. https://www.washingtonpost.com/politics/courts_law/texas-abortion-justice-lawsuit/2021/09/09/5d3eae0a-117a-11ec-9cb6-bf9351a25799_story.html (October 27, 2022).
[xiii] The law was blocked the evening of Oct. 6, 2021 and went back into effect the evening of Oct. 8, 2021.
[xiv] Throughout the paper, Texas abortion data obtained from Texas Department of State Health Services. https://www.hhs.texas.gov/about/records-statistics/data-statistics/itop-statistics (October 27, 2022).
[xv] New, 2022.
[xvi] Ibid.
[xvii] White K et al., Association of Texas' 2021 Ban on Abortion in Early Pregnancy With the Number of Facility-Based Abortions in Texas and Surrounding States. *JAMA.* 2022, E1-E8.
[xviii] Sanger-Katz, Miller, and Bui, 2022.
[xix] Taladrid S. "A Texas Teenagers Abortion Odyssey." *The New Yorker.* June 13, 2022. https://www.newyorker.com/magazine/2022/06/20/a-texas-teen-agers-abortion-odyssey (October 27, 2022)
[xx] Cartoof V and Klerman L. Parental Consent for Abortion: Impact of the Massachusetts Law. *American Journal of Public Health*. 1986. 76(4): 397-400.
[xxi] Joyce T, Kaestner R, Colman S. Changes in Abortions and Births and the Texas Parental Notification Law. *New England Journal of Medicine*. 2006; 354:1031-1038.
[xxii] Chrissman M et al., Effects of restricting federal funds for abortion—Texas, *Morbidity and Mortality Weekly Report*, 1980, 29(22):253–254.
[xxiii] Trussell J et al., The impact of restricting Medicaid financing for abortion, *Family Planning Perspectives*, 1980, 12(3):120–123 & 127–130.
[xxiv] Sheier R and Tell LJ, "Despite obstacles, most poor women pay for their abortions." *The Chicago Reporter*, 1980, 9(10):1–2 & 7.
[xxv] Cook PJ et al., The Effects of Short-Term Variation in Abortion Funding on Pregnancy Outcomes. *Journal of Health Economics.* 1999; 18(2): 241-257. doi: 10.1016/s0167-6296(98)00048-4.
[xxvi] Kortsmit K et al., Abortion Surveillance – 2019. *Mortality and Morbidity Weekly Report*. 2021; 70(9): 1-29. https://www.cdc.gov/mmwr/volumes/70/ss/ss7009a1.htm (October 27, 2021).
[xxvii] Callahan A. "How Realistic Is Your Due Date?" *The New York Times*. April 17, 2020. https://www.nytimes.com/2020/04/17/parenting/due-date-accurate.html (October 27, 2022).

Works Cited

Bitler Mariane and Madeline Zavodny. 2001. "The Effect of Abortion Restrictions on the Timing of Abortions." *Journal of Health Economics* 20(6):1011–1032.

Blank, Rebecca, Christine George, and Rebecca London. 1996. "State Abortion Rates: The Impact of Policies, Providers, Politics, Demographic, and Economic Environment." *Journal of Health Economics* 15(5): 513-553.

Colman, Silvie, Theodore Joyce, and Robert Kaestner. 2008. "Misclassification Bias and the Estimated Effect of Parental Involvement Laws on Adolescents' Reproductive Outcomes." *American Journal of Public Health*, 2008, 98(10): 1881-1885.

Colman, Silvie, and Theodore Joyce. 2011. "Regulating Abortion: Impact on Patients and Providers in Texas." *Journal of Policy Analysis and Management* 30(4): 775-797.

Dennis, Amanda, Stanley K. Henshaw, Theodore J. Joyce, Lawrence B. Finer, and Kelly Blanchard. 2009. "The Impact of Laws Requiring Parental Involvement for Abortion: A Literature Review." New York: Guttmacher Institute.

Ellertson, Charlotte. 1997. "Mandatory Parental Involvement in Minors' Abortions: Effects of the Laws in Minnesota, Missouri, and Indiana." *American Journal of Public Health* 87: 1367–1374.

Haas-Wilson, Deborah. 1993. "The Economic Impact of State Policy Restrictions on Abortion: Parental Consent and Notification Laws and Medicaid Funding Restrictions." *Journal of Policy Analysis and Management* 12: 498–511.

Haas-Wilson, Deborah. 1996. "The Impact of State Abortion Restrictions on Minors' Demand for Abortions." *Journal of Human Resources* 31:140–158.

Haas-Wilson, Deborah. 1997. "Women's Reproductive Choices: The Impact of Medicaid Funding Restrictions." *Family Planning Perspectives* 29(5):228-233.

Hansen, Susan D. 1980. "State Implementation of Supreme Court Decisions: Abortion Rates Since *Roe v. Wade*."*Journal of Politics* 42(2): 372-395.

Henshaw, Stanley K. 1995. "The Impact of Requirements for Parental Consent on Minor's Abortions in Mississippi." *Family Planning Perspectives* 27:120–122.

Henshaw, Stanley K., Theodore J. Joyce, Amanda Dennis, Lawrence B. Finer, and Kelly Blanchard. 2009. "Restrictions on Medicaid Funding for Abortions: A Literature Review." New York: Guttmacher Institute.

Joyce, Theodore, Stanley K. Henshaw, and JD Skatrud. 1997. "The Impact of Mississippi's Mandatory Delay Law on Abortions and Births." *Journal of the American Medical Association.* 278(8):653–658.

Joyce, Theodore and Robert Kaestner. 1996. "State Reproductive Health Policies and Adolescent Pregnancy Resolution: The Case of Parental Involvement Laws." *Journal of Health Economics* 15(5): 579-607.

Joyce, Theodore and Robert Kaestner. 2000. "The Impact of Mississippi's Mandatory Delay Law on the Timing of Abortion." *Family Planning Perspectives* 32(1):4–13.

Joyce, Theodore and Robert Kaestner. 2001. "The Impact of Mandatory Waiting Periods and Parental Consent Laws on the Timing of Abortion and the State of Occurrence among Adolescents in Mississippi and South Carolina." *Journal of Policy Analysis and Management* 20(2): 263-282.

Joyce, Theodore, Robert Kaestner, and Silvie Colman. 2006. "Changes in Abortions and Births and the Texas Parental Involvement Law*." New England Journal of Medicine* 354: 1031–1038.

Joyce, Theodore, Stanley K. Henshaw, Amanda Dennis, Lawrence B. Finer, and Kelly Blanchard. 2009. "The Impact of State Mandatory Counseling and Waiting Period Laws on Abortion: A Literature Review." New York: Guttmacher Institute.

New, Michael. 2007. "The Effect of Pro-Life Legislation on the Incidence of Abortion among Minors." *Catholic Social Science Review* 12:185–215.

New, Michael . 2009. "Using Natural Experiments to Analyze the Impact of State Legislation on the Incidence of Abortion." *Catholic Social Science Review* 14: 339-362.

New, Michael. 2011. "Analyzing the Effect of Anti-Abortion U.S. State Legislation in the Post-*Casey* Era." *State Politics and Policy Quarterly* 11(1): 28-47.

New, Michael 2014. "Analyzing the Impact of Antiabortion Legislation in the Post-Casey Era: A Reassessment. *State Politics and Policy Quarterly* 14(3): 228-268.

Ohsfeldt, Robert, and Stephan Gohman. 1994. "Do Parental Involvement Laws Reduce Adolescent Abortion Rates?" *Contemporary Economic Policy* 12:65–76.

Pierson, Vicky. 1995. "Missouri's Parental Consent Laws and Teen Pregnancy Outcomes." *Women and Health* 22(3): 47-57.

Rogers, James, Robert Boruch, George Storms, and Dorothy DeMoya. 1991. "Impact of the Minnesota Parental Notification Law on Abortion and Birth." *American Journal of Public Health* 81:294–98.

Trussell, James, Jane Menken, Barbara Lindheim, and Barbara Vaughan. 1980. "The Impact of Restricting Medicaid Financing For Abortion." *Family Planning Perspectives* 12(3):120–123 & 127–130.

Table 2: March to November Texas Births

Year	
2019:	285,799
2020:	277,947
2021:	284,862
2022:	293,262

Table 3: 2022 March to November Birth Increase

Compared to 2021	2.9 percent increase
Compared to 3 year average (2019, 2020, 2021)	3.7 percent increase

Table 4: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005***
	(0.012)	(0.002)
Heartbeat	0.205***	0.035***
	(0.035)	(0.006)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.
Data weighted by state population of women of childbearing age

Table 5: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005**
	(0.012)	(0.002)
Heartbeat	-0.899	-0.140
	(1.221)	(0.194)
Heartbeat* Logged Per Capita Income	0.101	0.016
	(0.112)	(0.018)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.
Data weighted by state population of women of childbearing age

Table 6: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005**
	(0.012)	(0.002)
Heartbeat	0.354***	0.062***
	(0.075)	(0.004)
Heartbeat*Poverty Rate	-0.010**	-0.002**
	(0.005)	(0.001)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.
Data weighted by state population of women of childbearing age

Table 7: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005***
	(0.012)	(0.002)
Heartbeat	0.129**	0.019**
	(0.057)	(0.009)
Heartbeat*Percentage Hispanic	0.019*	0.004**
	(0.011)	(0.002)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.

Table 8: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005***
	(0.012)	(0.002)
Heartbeat	0.280***	0.050***
	(0.049)	(0.008)
Heartbeat*Percentage Black	-0.006**	-0.001***
	(0.003)	(0.001)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.

Table 9: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005***
	(0.012)	(0.002)
Heartbeat	-0.583**	-0.061
	(0.265)	(0.042)
Heartbeat*Logged Distance	0.143***	0.018**
	(0.047)	(0.008)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.
Data weighted by state population of women of childbearing age

Table 10: Regression Results

Technique: Weighted Least Squares with month fixed effects and county fixed effects

Data analyzed from 115 Texas Counties with Complete Monthly Birth data from January 2019 to November 2022

	Model 1	Model 2
Dependent Variable	Monthly Birth Rate	Logged Monthly Birthrate
Annual Trend	-0.049***	-0.005***
	(0.012)	(0.002)
Heartbeat	-0.614**	-0.036
	(0.303)	(0.203)
Heartbeat*Hispanic	-0.003	0.002
	(0.113)	(0.002)
Heartbeat*Logged Distance	0.150***	0.011
	(0.060)	(0.010)
R squared	.932	.899
Number of Observations	5405	5405

* significant at the 10 percent level; **significant at the 5 percent level; *** significant at the one percent level

Notes:
Counties with incomplete birth data excluded
McLellan and Maverick County Excluded (Statistical Outliers)
Standard errors are in parentheses.
Data weighted by state population of women of childbearing age