

# A REPORT OF THE HERITAGE CENTER FOR DATA ANALYSIS

USING NATURAL EXPERIMENTS TO ANALYZE THE  
IMPACT OF STATE LEGISLATION ON THE  
INCIDENCE OF ABORTION

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# USING NATURAL EXPERIMENTS TO ANALYZE THE IMPACT OF STATE LEGISLATION ON THE INCIDENCE OF ABORTION

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During the 2004 election, there was a substantial amount of discussion about whether or not “pro-life” legislation<sup>1</sup> effectively reduces the incidence of abortion. Some religious leaders and political commentators urged pro-life voters to consider issues besides abortion when voting. Most of them argued that there is little that elected officials can do to stop abortion through legislation, or that the pro-life movement has not reaped any real benefits from supporting candidates who oppose abortion,<sup>2</sup> and that voters therefore should place greater emphasis on other issues.

It is true that the pro-life movement has not been successful in overturning *Roe v. Wade*. However, the pro-life movement’s success at the state level, especially during the 1990s, is often overlooked. Dur-

ing the 1990s, the amount of state pro-life legislation that was passed increased substantially. Furthermore, the number of abortions performed dropped by around 18 percent during the 1990s.<sup>3</sup>

However, correlation is not the same thing as causation. Other factors besides legislation could have contributed to this decline. So what impact has all of this legislation had? There is a fair amount of academic and policy literature that has examined the impact of pro-life legislation at the state level. Many studies have found that different types of pro-life legislation have been effective in reducing the number of abortions in a given state.<sup>4</sup>

Nonetheless, one shortcoming that is common to all of these studies is that pro-life legislation is not a random occurrence. It is possible that the

1. Both legislation intended to reduce the number of abortions and those who support such legislation are often called “pro-life.” This widely accepted term is used throughout this study.
2. Glen Harold Stassen, “Pro-Life? Look at the Fruits,” *The Courier Journal*, October 11, 2004.
3. Laurie D. Elam-Evans, Lilo T. Strauss, Joy Herndon, Wilda Y. Parker, Sara Whitehead, and Cynthia J. Berg, “Abortion Surveillance—United States, 1999,” Centers for Disease Control and Prevention *Morbidity and Mortality Weekly Report*, Vol. 51 (November 29, 2002), pp. 1–28, at [www.cdc.gov/mmwr/preview/mmwrhtml/ss5109a1.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5109a1.htm) (January 11, 2006). Calculation by author.
4. Deborah Haas-Wilson, “The Impact of State Abortion Restrictions on Minors’ Demand for Abortions,” *The Journal of Human Resources*, Vol. 31, No. 1 (Winter 1996), pp. 140–158; Deborah Haas-Wilson, “The Economic Impact of State Policy Restrictions on Abortion: Parental Consent and Notification Laws and Medicaid Funding Restrictions,” *Journal of Policy Analysis and Management*, Vol. 12, No. 3 (Summer 1993), pp. 498–511; Patricia Donovan, “Judging Teenagers: How Minors Fare When They Seek Court Authorized Abortions,” *Family Planning Perspectives*, Vol. 15, No. 6 (1983), pp. 259–267; Rebecca M. Blank, Christine C. George, and Rebecca A. London, “State Abortion Rates: The Impact of Policies Providers, Politics, Demographics, and Economic Environment,” National Bureau of Economic Research *Working Paper* No. 4853, September 1994 (subsequently published in the *Journal of Health Economics*, Vol. 15 [1996], pp. 513–553); and Robert Ohsfeldt and Stephan Gohman, “Do Parental Involvement Laws Reduce Adolescent Abortion Rates?” *Contemporary Economic Policy*, Vol. 12, No. 2 (April 1994), pp. 65–76.

states that are passing pro-life legislation are also the states that are becoming more conservative or religious. Indeed, these changes in values and mores, not the legislation itself, might be responsible for these abortion declines. This potentially biases the findings of these academic and policy studies.

Social scientists refer to such problems as “endogeneity problems.” Since running randomized experiments is usually not practical for social scientists, resolving these problems is often difficult. However, pro-life laws that have been passed by legislatures and subsequently nullified by state judiciaries present researchers with a unique opportunity to resolve these endogeneity problems.

These nullified laws create a nice set of natural experiments. Presumably, all states that pass pro-life legislation are undergoing similar changes in values and mores. However, in some states, the legislation took effect (enacted-legislation states), and in other states, the legislation was nullified (nullified-legislation states). Comparing nullified-legislation states to enacted-legislation states effectively holds constant any changes in values or mores and provides better insights into the effectiveness of pro-life legislation.

Overall, this research finds that value shifts have little impact on the incidence of abortion. Conversely, enacted legislation results in statistically significant reductions in abortion rates and ratios. This provides even more evidence that state pro-life legislation has been effective in reducing the number of abortions in a given state. Furthermore, it provides additional support for the idea that pro-life legislation was partly responsible for the substantial decreases in abortion rates and ratios during the 1990s.

## BACKGROUND

During the 1990s, there was a substantial amount of pro-life activity at the state level. For instance:

- In 1992,<sup>5</sup> virtually no states were enforcing informed consent laws.<sup>6</sup> By 2000, 27 states had informed consent laws in effect.<sup>7</sup>
- In 1992, no states had banned or restricted partial-birth abortion. By 2000, 12 states had bans or restrictions in effect.<sup>8</sup>
- In 1992, only 20 states were enforcing parental involvement statutes.<sup>9</sup> By 2000, 32 states were enforcing these laws.<sup>10</sup>

What impact has all of this legislation had? Much of the academic literature that examines the impact of state abortion policy focuses on parental involvement legislation and the extent to which states fund abortion through Medicaid. Most of these studies argue that parental involvement laws and restrictions on Medicaid funding reduce the number of abortions that take place within the boundaries of a given state.<sup>11</sup>

More recently, I published a more comprehensive study examining the impact of a wider range of legislation, including informed consent laws and bans on partial-birth abortion. This study analyzed data from 49 states over a span of 15 years and held constant a variety of economic and demographic variables. All four types of pro-life legislation that I analyzed—partial-birth abortion bans, parental involvement laws, informed consent requirements, and public funding restrictions—were correlated with reductions in the incidence of abortion. In particular, public funding restrictions and informed consent laws had the largest and most statistically significant impact.<sup>12</sup>

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5. Prior to 1992, courts struck down most informed consent laws; however, a few fairly weak laws remained in effect.

6. NARAL Foundation, *Who Decides? 1992*, p. 9.

7. NARAL Foundation, *Who Decides? 2000*, p. 125.

8. *Ibid.*

9. NARAL Foundation, *Who Decides? 1992*, p. 125.

10. NARAL Foundation, *Who Decides? 2000*, p. 125.

11. Haas-Wilson, “The Impact of State Abortion Restrictions on Minors’ Demand for Abortions,” pp. 140–158; Haas-Wilson, “The Economic Impact of State Policy Restrictions on Abortion,” pp. 498–511; Donovan, “Judging Teenagers,” pp. 259–267; Blank *et al.*, “State Abortion Rates”; and Ohsfeldt and Gohman, “Do Parental Involvement Laws Reduce Adolescent Abortion Rates?” pp. 65–76.

## ENDOGENEITY PROBLEMS

Indeed, the bulk of the academic and policy literature indicates that the passage of state pro-life legislation is associated with a decline in abortion rates and ratios. However, some observers might question whether the legislation is actually causing these declines. The enactment of pro-life legislation is not a random occurrence. Indeed, it is possible that the states that are passing this type of legislation are also the states that are becoming more religious or conservative and that these shifts in values, not the legislation itself, are causing the abortion declines.

Resolving these sorts of endogeneity problems is often difficult for social scientists. Generally speaking, unlike researchers in the hard sciences, social scientists cannot test their theories through experimentation. Instead, social scientists must observe social phenomena and make the best inferences that they can.

However, in this case, these endogeneity problems can be resolved through a nice set of natural experiments. In many states, legislators have passed pro-life legislation only to have it subsequently nullified by the judiciary. If the passage of pro-life legislation reflects a shift in values, then it seems reasonable to assume that all of the states that passed pro-life legislation experienced a similar shift in values. However, in some states, the legislation took effect, whereas in other states, it was nullified by the judiciary.

If value shifts are responsible for the abortion declines, then abortion declines in enacted-legislation states should be similar to declines in nullified-legislation states. However, if the legislation is hav-

Table 1		CDA 06-01
Recent Judicial Nullifications of Parental Involvement Laws		
State	Dates	
Georgia	July 1987 to September 1991	
Minnesota	November 1986 to October 1990	
Mississippi	July 1986 to July 1993	
South Dakota	July 1993 to July 1997	
Tennessee	October 1989 to February 1992	
Tennessee	July 1996 to July 1999	

**Sources:** Jon Merz, Catherine Jackson, and Jacob Klerman, "A Review of Abortion Policy: Legality, Medicaid Funding, and Parental Involvement, 1967–1994." *Women's Rights Law Reporter*, Vol. 17, No. 1 (1995), pp. 12–57, and NARAL Foundation, *Who Decides? 1991–2000*.

ing an effect, then enacted-legislation states would have significantly larger abortion declines than nullified-legislation states. Therefore, comparing the declines in enacted-legislation states with declines in nullified-legislation states can provide further insights into the effectiveness of pro-life legislation.

In recent years, there have been at least six occasions when judges have blocked or delayed the enactment of parental consent laws (see Table 3) and at least two occasions when judicial rulings prevented informed consent laws from going into effect (see Table 4).<sup>13</sup> By running a series of regressions, it was possible to compare the impact of enacted legislation to the impact of nullified legislation.

## METHODOLOGY

Comparing nullified-legislation states to enacted-legislation states involves a regression analysis on a dataset that includes abortion data from nearly every state between the years of 1985 and 1999. Regression analysis is well suited to this type of research because it allows simultaneous examination of various factors' effects on the number of abortions in each state.

12. Michael J. New, Ph.D., "Analyzing the Effects of State Legislation on the Incidence of Abortion During the 1990s," Heritage Foundation *Center for Data Analysis Report No. 04–01*, January 21, 2004, at [www.heritage.org/Research/Family/CDA04-01.cfm](http://www.heritage.org/Research/Family/CDA04-01.cfm).
13. In the original Heritage Foundation study, the author also examined the impact of Medicaid funding restrictions and partial-birth abortion bans. However, the impact of these laws cannot be tested through natural experiments. This is because the researcher found no instances in which a state judiciary nullified a Medicaid funding restriction. Furthermore, while there are some instances of judges nullifying partial-birth abortion bans, there exist insufficient data to examine them properly.

Separate regressions were run on a pair of dependent variables that measure the number of abortions in each state. The first dependent variable measures the state abortion ratio: the number of abortions per 1,000 births. The second set of dependent variables measure the state abortion rate: the number of abortions per 1,000 women between the ages of 15 and 44. Data on both the abortion rate and the abortion ratio were obtained from the Centers for Disease Control and Prevention (CDC).

A variety of economic and demographic factors were held constant. To capture the impact of the economy, each state's annual per capita personal income growth was included in the regression model. Three separate variables measured the percentage of women of childbearing age<sup>14</sup> between the ages of 15 to 19, 20 to 25, and 25 to 29. Younger women facing unexpected pregnancies were hypothesized to be more likely to seek abortions than their older counterparts. As a result, holding other factors constant, relatively higher percentages of younger women would be likely to lead to increases in both abortion rates and abortion ratios. In addition, a series of variables measuring the racial composition of women between the ages of 15 and 44 in each state were also included in the model.

Finally, a fertility variable measuring the number of births per thousand women between the ages of 15 and 44 was included in the model. This variable served as a proxy for the number of pregnancies that occurred. Fewer pregnancies would result in fewer abortions. Similarly, if the fertility variable is low, it might indicate that a higher proportion of pregnancies are planned, which would also result in fewer abortions.

To examine the impact of different types of state policies that deal directly with access to abortion, four separate variables were included in the regression analysis to indicate the presence or absence of each of four policies.

*First* is the presence of a parental involvement requirement.<sup>15</sup> Parental involvement requirements

Table 2		CDA 06-01
Recent Judicial Nullifications of Informed Consent Laws		
State	Dates	
Indiana	1995–2003	
Michigan	1995–1999	

Sources: NARAL Foundation, *Who Decides?* 1991–2000, and Michigan Right to Life, "A Woman's Right to Know—Informed Consent," at [www.rtl.org/html/legislation/woman\\_t\\_right\\_to\\_know.html](http://www.rtl.org/html/legislation/woman_t_right_to_know.html) (January 12, 2006).

require minors to notify or receive consent from one or both parents before receiving an abortion.

*Second* is whether or not a state restricts Medicaid funding of therapeutic abortions. Most states will fund abortions through Medicaid when the pregnancy is the result of rape. Similarly, most states fund abortions that are necessary to preserve the life of the mother. However, states differ as to whether they fund abortions that are therapeutic in nature.

*Third* is whether or not a state has an informed consent statute. Informed consent statutes differ from state to state, but they all require women seeking abortions to receive information about the abortion procedure. This can include information about fetal development, any health risks involved with obtaining an abortion, or public and private support for single mothers.

*Fourth* is whether a state has a ban on partial-birth abortions. The Supreme Court struck down all partial-birth abortion bans in *Stenberg v. Carhart* in 2000. However, partial-birth abortion bans were upheld in 12 states between 1996 and 2000.

Table 3 gives a list of the data sources used.

Finally, to examine the impact of nullified legislation, two additional independent variables were added. The first independent variable indicated states where the judiciary nullified a parental involvement law. The second independent variable indicated states where the judiciary nullified an informed consent law. By comparing enacted-legislation states to the nullified-legislation states, better

14. In this paper, women between the ages of 15 and 44 are considered to be of childbearing age.

15. Both parental consent and parental notification statutes are considered parental involvement requirements.

insights can be obtained into the impact of pro-life legislation.

The regression analysis uses a fixed effects model<sup>16</sup> in which separate indicator variables are included for every state and year. The complete regression results are in Appendix A. The comparisons between the nullified and the enacted legislation are in Table 4 and Table 5.

**DISCUSSION**

Overall, the findings indicate that enacted legislation has a much larger impact than value shifts correlated with the passage of legislation. Furthermore, the difference between enacted-legislation states and nullified-legislation states achieves statistical significance in each of the two regressions. This provides solid evidence that legislation, not factors correlated with the passage of the legislation, caused the decreases in the incidence of abortion.

In, particular, Table 4 and Chart 1 show that, when an informed consent law takes effect, the regression model predicts that the abortion ratio decreases by 10.34 abortions for every thousand live births and the abortion rate decreases by 0.86 abortions per thousand women between the ages of 15 and 44. Nullified-legislation states experience increases in both the abortion rate and ratio. More important, the difference between nullified-legislation states and enacted-legislation states achieves statistical significance.

Similarly, Table 5 and Chart 1 indicate that when a parental involvement law is enacted, the abortion rate decreases by 16.37 abortions for every thousand live births and the abortion rate decreases by 1.15 abortions for every thousand women between the ages of 15 to 44. Parental involvement laws that are passed by a legislature and then later nullified by the judiciary result in modest increases in the

Table 3		CDA 06-01
<b>Data Sources</b>		
Variable	Source	
State Abortion Ratio (Number of abortions per 1,000 live births)	1. CDC 2. Alan Guttmacher Institute	
State Abortion Rate (Number of abortions per 1,000 women between the age of 15 and 44)	1. CDC 2. Alan Guttmacher Institute	
Per Capita Personal Income Growth	Bureau of Economic Analysis	
Percentage of women of childbearing age who are between the ages of 15 to 19	U.S. Census Bureau	
Percentage of women of childbearing age who are between the ages of 20 to 24	U.S. Census Bureau	
Percentage of women of childbearing age who are between the ages of 25 to 29	U.S. Census Bureau	
Racial demographics by state	U.S. Census Bureau	
Partial Birth Abortion Ban	<i>Who Decides?</i> (1991–2000)	
Informed Consent Law	<i>Who Decides?</i> (1991–2000)	
Parental Consent Law	1. Merz, Jackson, and Kellerman 2. <i>Who Decides?</i> (1991–2000)	
Medicaid Funding of Abortions	1. Merz, Jackson, and Kellerman 2. <i>Who Decides?</i> (1991–2000)	

abortion rate and a modest decline in the abortion ratio. Once again, the difference reaches conventional standards of statistical significance.

The full regression results (see Appendix A) indicate that other types of legislation, including Medicaid funding restrictions and partial-birth abortion bans, also result in reductions in the incidence of abortion. However, in these cases, comparisons between enacted-legislation states and nullified-legislation states cannot be drawn because no instance of judicial nullifications of Medicaid funding restrictions could be identified. Furthermore, since the judicial nullifications of partial-birth abortion bans took place in the late 1990s, there are insufficient data to draw proper comparisons.

16. A fixed effect model allows examination of the intrastate effects of pro-life legislation. By holding the individual states constant, the regression compares the abortion rate before legislation was passed to the abortion rate after legislation was passed and determines whether the differences are statistically significant.

Table 4 CDA 06-01

### The Impact of Informed Consent Laws

Status of Law	Enacted	Nullified	Difference
Abortion Ratio (CDC)	-10.34	10.71	21.05*
Abortion Rate (CDC)	-0.86	0.38	1.24*

\* Significant at the 10 percent level.

**Note:** The complete regression results can be found in Appendix A. When abortion data from the Alan Guttmacher Institute (AGI) were used, the results were broadly similar. However, since AGI does not release data every year, there were not enough datapoints to make meaningful comparisons.

**Sources:** Author's calculations based on data from Centers for Disease Control and Prevention (CDC), and NARAL Foundation, *Who Decides?* 1991–2000.

Table 5 CDA 06-01

### The Impact of Parental Involvement Laws

Status of Law	Enacted	Nullified	Difference
Abortion Ratio (CDC)	-16.37	0.65	17.02*
Abortion Rate (CDC)	-1.15	-0.02	1.13*

\* Significant at the 10 percent level.

**Note:** The complete regression results can be found in Appendix A. When abortion data from the Alan Guttmacher Institute (AGI) were used, the results were broadly similar. However, since AGI does not release data every year, there were not enough datapoints to make meaningful comparisons.

**Sources:** Author's calculations based on data from the Centers for Disease Control and Prevention (CDC), and NARAL Foundation, *Who Decides?* 1991–2000.



However, the results clearly indicate that value shifts correlated with the passage of legislation affect the incidence of abortion only marginally. This means that any outside factors that are correlated with the passage of pro-life legislation have only a marginal impact on the number of abortions that occur. It therefore seems likely that the abortion declines associated with partial-birth abortion bans and Medicaid funding restrictions were caused by the legislation itself and not by any outside factors correlated with the passage of the legislation.

## CONCLUSION

The number of abortions that were performed increased throughout the 1970s and the 1980s.<sup>17</sup> However, that trend reversed itself during the 1990s as the number of legal abortions declined by 18.4 percent between 1990 and 1999.<sup>18</sup>

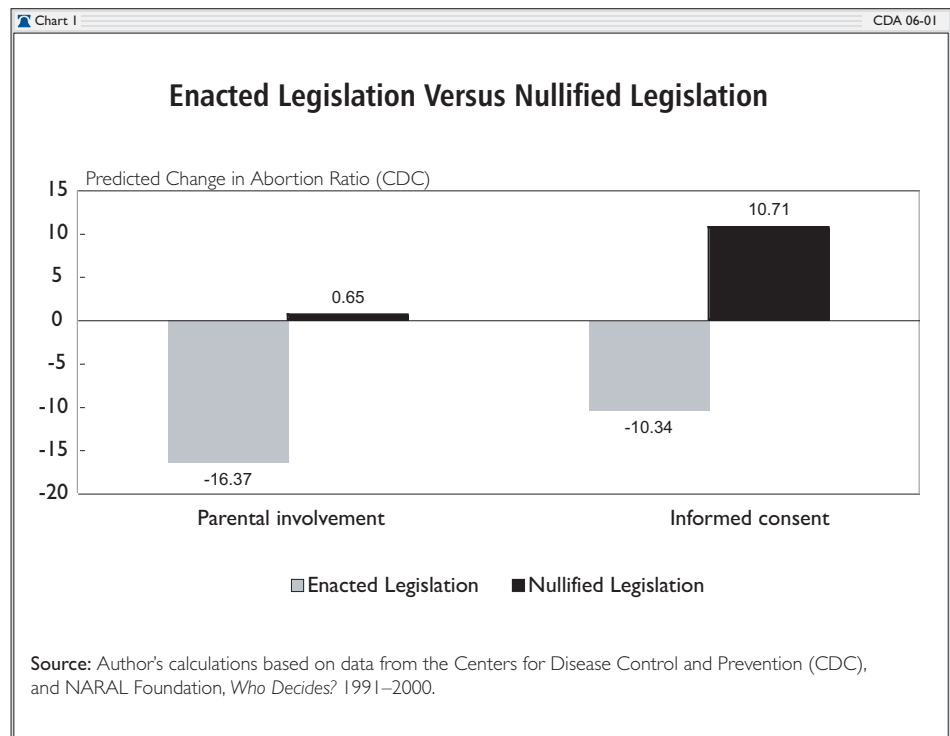
There are a number of different reasons for this decline. However, one factor that cannot be overlooked is the impact of state pro-life legislation. By the end of the decade, more states had adopted parental involvement requirements, informed consent requirements, and partial-birth abortion bans.<sup>19</sup>

A number of academic and policy studies find that there is a correlation between the passage of pro-life legislation and a reduction in the incidence of abortion. However, some have argued that changes in values or mores in states that have passed such legislation may be responsible for

these declines. By comparing the impact in states that enacted legislation to the impact in states that nullified legislation, this study is able to resolve some of these endogeneity problems.

This study analyzes six states where parental involvement laws were nullified and two states where informed consent laws were nullified. The regression findings indicate that enacted legislation results in statistically significant declines in the incidence of abortion, while value shifts correlated with the passage of legislation have little impact. This shows with greater certainty that pro-life legislation has been effective in reducing the number of abortions that have taken place.

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17. Elam-Evans *et al.*, "Abortion Surveillance."

18. Centers for Disease Control and Prevention, *Morbidity and Mortality Weekly Report*, Vol. 42 (December 17, 1993), pp. 34–35, and Elam-Evans *et al.*, "Abortion Surveillance." Calculation by author.

19. NARAL Foundation, *Who Decides?* 1992, pp. 125–127, and *Who Decides?* 2000, pp. 125–127.

# Appendix A

Appendix A <span style="float: right;">CDA 06-01</span>		
<b>Regression Results: Analyzing the Natural Experiments</b>		
Dependent Variable	Abortion Ratio	Abortion Rate
Data Source	CDC	CDC
Number of Observations	649	649
Income Growth	-1.65 (1.04)	-0.15** (0.08)
Percent Black	13.41** (6.39)	1.03** (0.45)
Percent Native American	-0.32 (3.21)	0.17 (0.22)
Percent Hispanic	9.56*** (3.52)	0.41 (0.26)
Percent Asian	-29.54*** (8.53)	-1.87*** (0.63)
Percent 15-19	-7.16* (4.25)	-0.32 (0.31)
Percent 20-24	2.30 (3.38)	0.20 (0.24)
Percent 25-29	2.19 (4.50)	0.07 (0.33)
Fertility Rate	-3.40*** (0.94)	0.19** (0.09)
Nullified Parental Involvement	0.65 (8.34)	-0.02 (0.60)
Parental Involvement	-16.37** (7.01)	-1.15** (0.50)
Nullified Informed Consent	10.71 (8.53)	0.38 (0.64)
Informed Consent	-10.34** (6.41)	-0.86* (0.48)
Medicaid Funding Restriction	-31.94*** (8.31)	-2.26*** (0.61)
Partial Birth Ban	-10.91 (9.44)	-1.36** (0.68)
Constant	90.65** (39.38)	-2.42 (2.95)
R Squared	0.968	0.971

\* Significant at the 10 percent level.  
 \*\* Significant at the 5 percent level.  
 \*\*\* Significant at the 1 percent level.

Technique: Fixed effects independent variable regression model with state and year indicator variables. Corrected for autocorrelation. Robust standard errors. Data weighted by state population.

**Note:** Standard errors are in parentheses. Data includes all states, except for Alaska and Kansas, 1985-1999 inclusive. Selected data points from other states were omitted due to unreported data or irregularities with how the data were collected. See Appendix B for details.

**Sources:** Author's calculations based on data from the Centers for Disease Control and Prevention (CDC); U.S. Bureau of the Census; U.S. Department of Commerce, Bureau of Economic Analysis; Alan Guttmacher Institute; Jon Merz, Catherine Jackson, and Jacob Klerman, "A Review of Abortion Policy: Legality, Medicaid Funding, and Parental Involvement, 1967-1994," *Women's Rights Law Reporter*, Vol. 17, No. 1 (1995), pp. 12-57; and NARAL Foundation, *Who Decides?* 1991-2000.

## Appendix B

### Information on Abortion Data Received from the CDC

Alaska, California, New Hampshire, and Oregon did not report data to the Centers for Disease Control and Prevention in 1998 and 1999.

Data from Alaska are omitted because of data collection problems. Data from Kansas are omitted as well.

According to CDC data, the abortion rate jumped an astounding 69 percent between 1991 and 1999, and this cannot be traced to any shifts in economics, policy, or demographics in Kansas or neighboring states. Instead, it appears that the presence of a Dr. Tiller, who is one of the few doctors in the country specializing in late-term abortions, may be responsible for this increase. Indeed, for every year between 1992 and 1999, the CDC reports that over 40 percent of the abortions in Kansas were performed on out-of-state residents. This is by far the highest figure for any state.

Nearly all states reported abortion data to the CDC through their central health agencies. However, some state data were obtained from hospitals and other medical facilities. Since these differences in reporting may bias the results, the data from the following states and years are omitted from the CDC control:

Alabama	1981–1990
Iowa	1981–1997
New Hampshire	1981–1997
West Virginia	1981–1998
Illinois	1984–1987
Kentucky	1984–1986
Oklahoma	1984–1997