

# **Ecological Study of Selected Predictors and Abortion Rates by State, 2005**

John Hart

*This ecological study compares 2005 abortion rates by state to a number of variables thought to be related to abortion. Higher abortion rates were observed in states having: 1) larger vote for Democratic Party candidate for president, 2) higher percent Catholic population, 3) higher black population, 4) lower income, and 5) higher number of abortion providers.*

## **INTRODUCTION**

Previous research on predictors of abortion rates in eighty-nine countries found that economics, employment, and religion predicted abortions rates.<sup>1</sup> In the U.S., in the 1970s and early 1980s, the strongest predictor of abortion rates was the availability of abortion facilities.<sup>2</sup> Barone notes a relationship between states that voted more for President Obama and higher than average abortion rates in many of these states.<sup>3</sup> Other literature states that the relationship between political party and abortion rates is not clear.<sup>4</sup> The author was unable to locate more recent papers on the topic of factors that affect abortion factors.

The present study looks at five variables the author considers to be possibly associated with abortion. Among these variables, it was hypothesized that abortion rates would be higher in states that had: 1) larger Democratic vote (the party platform contains a “pro-choice” plank); 2) lower percent Catholic population (the Catholic Church takes a strong pro-life position); 3) higher percent of black women (abortion rates are higher among African-American women than among white women<sup>5</sup>); 4) lower income (financial inability to care for children is one motivation for choosing abortion); and 5) higher ratio of abortion providers.

## **METHODS**

The response variable in this ecological study was abortion rates (per 1,000 women aged 15–44 by place of residence) by state (fifty states plus the District of Columbia; referred to now as “states”) in 2005.<sup>6</sup> The following five variables were obtained for each state and are considered as predictor variables for the 2005 abortion rates: 1) presidential election data

for 2004;<sup>7</sup> 2) Catholic population as percentage of the total population in 2006;<sup>8</sup> 3) black population as percentage of the total population in 2005;<sup>9</sup> 4) median income in 2005;<sup>10</sup> and 5) number of abortion providers in 2005<sup>11</sup> expressed as a ratio to population in thousands in 2005.<sup>12</sup>

The author was unable to find statistics on the percentage of black women in the population so he assumed that this number is closely correlated with the percentage for both genders, that is, approximately one-half of the total percentage of African-Americans. The percentages of total popular vote received by presidential candidates of the two major parties (Democratic and Republican) were calculated for each state by subtracting the two figures, Democrat minus Republican, where a “negative percentage” indicated a Republican majority vote and a positive percentage indicated a Democrat majority vote. For example, in Alabama, the Democrats’ vote was 36.8% compared to the Republicans’ 62.5, and subtracting these two supplied a figure of -25.7. The small percentage of minority party voting was assumed to have an insignificant effect on data analysis.

All values for all predictors (for each state) were transformed to z scores (a measurement of deviation from the mean) to standardize the predictor data. The abortion data remained as-is, as a rate. Because the data contained outliers, the Spearman test (a measure of the statistical dependence of two variables) was used for correlation while analysis with and without abortion outliers was performed in linear multiple regression (LMR).<sup>13</sup> For LMR, the robust command was included to help with the non-normal distribution of the response variable (abortion). Predictors that showed statistically significant correlations ( $p \leq 0.05$ ) were included in regression.

Direct relationships are those that rise and fall together while inverse relationships are those where the two variables “go” in opposite directions. A direct correlation in voting, for example, would consist of increased Democratic Party vote (expressed as a more positive number) and increased abortion rates. Strengths of the predictors in LMR are based on their beta (standardized) coefficients.

**Table 1. Descriptive statistics for standardized values (z scores) for all variables. Obs = number of observations. SD = standard deviation. Min = minimum value observed. Max = maximum value observed. See note in Methods section for explanation of predictor “Voting.”**

<b>Variable</b>	<b>Obs</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Abortion	51	-0.0052941	0.9996326	-1.23	3.5
Voting	51	-0.002549	1.00156	-1.92	4.14
Black	51	0.0033333	1.007892	-0.92	4.23
Catholic	51	0.0009804	1.003618	-1.17	3.33
Income	51	0.0001961	0.999835	-1.74	2.19
Abortion providers	51	0.0000005	0.999936	-1.01	4.13

## RESULTS

Descriptive statistics are provided in Table 1. All correlations showed direct, statistically significant correlations with approximately moderate strength (Table 2), with strongest-to-weakest predictors as follows: voting, number of abortion providers, income, black population, and Catholic population. A scatter plot is provided in Figure 1 (page 375) for the main research question, about abortion rates and voting.

**Table 2. Inferential statistics for correlation.** *r* = Spearman correlation coefficient. *p* = corresponding *p*-value for the correlation coefficient. All correlations were statistically significant at the 0.05 alpha level. See note in Methods section for explanation of predictor “Voting.”

Response variable: Abortion

<b>Predictor</b>	<b>r</b>	<b>p</b>
Voting	0.698	0.0000
Black	0.455	0.0008
Catholic	0.377	0.0064
Income	0.598	0.0000
Abortion providers	0.624	0.0000

**Table 3. Inferential statistics for regression, with abortion outliers (51 observations).** Response variable = abortion. *R*-squared = 0.745. The higher the beta value the stronger the predictive strength. All predictor beta values are positive, indicating a direct relationship with abortion rates, that is, as the predictor increases, so too does the abortion rates. See note in Methods section for explanation of predictor “Voting.”

<b>Predictor</b>	<b>t</b>	<b>p</b>	<b>Beta</b>
Voting	2.42	0.020	0.263
Black	4.75	0.000	0.414
Catholic	1.17	0.248	0.145
Income	2.76	0.008	0.291
Abortion providers	1.79	0.081	0.215

**Table 4. Inferential statistics for regression, without abortion outliers (48 observations).** Response variable = abortion. *R*-squared = 0.642. The higher the beta value the stronger the predictive strength. All predictor beta values are positive, indicating a direct relationship with abortion rates, that is, as the predictor increases, so too does the abortion rates. See note in Methods section for explanation of predictor “Voting.”

<b>Predictor</b>	<b>t</b>	<b>p</b>	<b>Beta</b>
Voting	3.13	0.003	0.332
Black	4.07	0.000	0.373
Catholic	0.45	0.651	0.048
Income	3.12	0.0033	0.402
Abortion providers	1.35	0.185	0.156

Results for LMR, with abortion outliers, revealed the following association with predictors, from strongest to weakest: 1) black population (high statistical significance), 2) income (high statistical significance), 3) voting (moderate statistical significance), 4) ratio of abortion providers (low statistical significance), and 5) Catholic population (not statistically significant; Table 3). Without abortion outliers, the following association,

with predictors, from strongest to weakest was revealed: 1) income (high statistical significance), 2) black population (high statistical significance), 3) voting (high statistical significance), 4) ratio of abortion providers (not statistically significant), and 5) Catholic population (not statistically significant; Table 4).

## DISCUSSION

The direct correlation for voting means that as states voted more for the Democratic candidate in 2004, higher abortion rates followed in 2005. Direct correlations for the other predictors indicates that as they increased (e.g., income), so too did abortion rates. The remaining predictors also showed direct relationships, both in correlation and LMR.

The strongest predictor in the LMR model that included abortion outliers (Table 3) was black population. In the model without the abortion outliers, the strongest predictor was income (Table 4). In both LMR models, the weakest predictor was Catholic population. It may be initially surprising that this predictor does not show an inverse association with abortion rates, given the pro-life position in Catholic teaching. However, when one looks deeper into the issue of Catholics' views on moral issues, a different picture emerges. A Gallup survey found that Catholics who attend church regularly are "significantly less likely" to find activities such as abortion morally acceptable.<sup>14</sup> The other surprising finding, concerning income, tends to refute the notion that mothers in poverty tend to get abortions more than mothers not in poverty. It is not clear why there would be a direct relationship between percentage of black population and abortion rates, though previous research also indicates this.<sup>15</sup> Former Republican presidential candidate Herman Cain, an African-American, has suggested that the increased rate among blacks is part of a plan to reduce the number of black babies born, a suggestion that Planned Parenthood rejects.<sup>16</sup> Clearly, more research is needed to answer this question.

What is not surprising in this study is the direct association between abortion rates and Democratic Party vote (given its "pro-choice" plank). A recent study on 2008 presidential voting and 2011 abortion rates revealed a similar finding.<sup>17</sup> In the present study, the correlation between abortions and number of abortion providers is also not surprising, though this association weakened somewhat in LMR compared to correlation analysis.

Limitations to this study include its design, namely, that it is an ecological study, where groups rather than individuals are studied. This means, for example, in the case of voting, the political views of individuals and how these specific individuals voted are unknown. Thus, a particular Democratic Party voter could vote more for pro-life candidates than a particu-

lar Republican Party voter. All that can be said on the basis of this study regarding voting is that there is a statistically significant correlation, at the level of the states, between percentage Democratic vote and abortion rates.

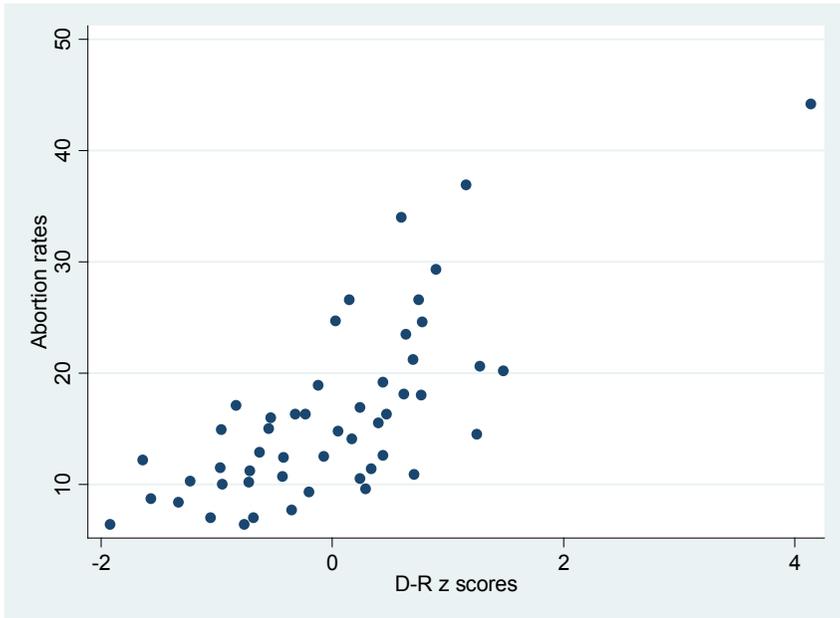


Figure 1. Scatter plot for abortion rates and voting. D-R: Democrat-Republican vote, where a larger score = larger Democrat vote for each state. Abortion rates are per 1,000 females age 15–44. Voting data represented as z scores. The plot shows that as Democratic Party vote increases, abortion rates tend to also increase.

### Notes

1. K. Trent and A. W. Hoskin, “Structural Determinants of the Abortion Rate: A Cross-Societal Analysis,” *Social Biology* 46:1–2 (1999): 62–81.
2. J. A. Borders and P. Cutright, “Community Determinants of U.S. Legal Abortion Rates,” *Family Planning Perspectives* 11:4 (1979): 227–33; S. B. Hansen, “State Implementation of Supreme Court Decisions: Abortion Rates Since *Roe v. Wade*,” *The Journal of Politics* 42:2 (1980): 372–95.
3. M. Barone, “Abortion Rates and Voting Behavior,” *The American*. Available at <http://blog.american.com/2009/11/abortion-rates-and-voting-behavior/>.
4. R. M. Blank, C. C. George, and R. A. London, “State Abortion Rates: The Impact of Policies, Providers, Politics, Demographics, and Economic Environment,” *Journal of Health Economics* 15 (1996): 513–53.
5. S. Cohen, “Abortion and Women of Color: The Bigger Picture,” *Guttmacher Policy Review* 11:3 (2008). Available at <http://www.guttmacher.org/pubs/gpr/11/3/gpr110302.html>.

6. U.S. Census Bureau, Table 101: “Abortions: Number and Rate by State of Occurrence, 2000 and 2005, and Residence, 2005”; available at [www.census.gov](http://www.census.gov).
7. U.S. Census Bureau, Table 399: “Popular Vote Case for President by Political Party—States: 2004 and 2008.”
8. AskACatholic.com, which cites *Our Sunday Visitor 2007 Catholic Almanac*. Available at [www.askacatholic.com](http://www.askacatholic.com).
9. U.S. Census Bureau, Table 23: “Resident Population by Race, Hispanic or Latino Origin, and State: 2005”; available at [www.census.gov](http://www.census.gov).
10. U.S. Census Bureau, “Median Household Income, 2005.”
11. R. K. Jones and K. Kooistra, “Abortion Incidence and Access to Services in the United States, 2008,” *Perspectives on Sexual and Reproductive Health* 43:1 (2011): 41–50.
12. U.S. Census Bureau, Table 17, “Resident Population—States: 1980 to 2005,” *Statistical Abstract of the United States, 2007*. Available at [www.census.gov](http://www.census.gov).
13. Analysis was performed using the software program Stata IC 12 (College Station, Tex.: StataCorp).
14. F. Newport, “Catholics Similar to Mainstream on Abortion, Stem Cells,” Gallup.com. Available at [www.gallup.com](http://www.gallup.com).
15. Cohen, “Abortion and Women of Color.”
16. “Planned Parenthood Rejects Cain Claim Abortion Clinics Are Aimed at Black ‘Genocide,’” Foxnews.com (October 30, 2011). Available at <http://www.foxnews.com/politics/2011/10/30/planned-parenthood-rejects-cain-claim-abortion-clinics-are-aimed-at-black/>.
17. R. Florida, “The Geography of Abortion,” *The Atlantic Cities* (June 11, 2012); available from <http://www.theatlanticcities.com/politics/2012/06/geography-abortion/1711/>. Cited by M. New, “Pro-Obama Blue States Have Higher Abortion Rates than Red States,” LifeNews.com (June 19, 2012); available from <http://www.lifenews.com/2012/06/19/pro-obama-blue-states-have-high-abortion-rates-than-red-states/>.