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# EXPLORING THE COMPLEX RELATIONSHIP BETWEEN RELIGIOSITY AND ABORTION RATES IN THE UNITED STATES

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A SOCIOPOLITICAL ANALYSIS USING SPSS



**ACADEMIC RESEARCH PAPER**

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**Course Work: Research Methods and Applied Statistics**

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## I. INTRODUCTION

What is the relationship between religiosity and abortion rates across the diverse states of the United States of America, and how can this relationship be explained or understood within the broader social and political context of the country? Abortion is a contentious and divisive topic that is heavily influenced by divergent perspectives and attitudes informed by a range of factors including religious beliefs and public opinion. The complex and nuanced relationship between religiosity and abortion rates has significant implications for public health, social policy, and individual rights. Given the importance of this issue, this research aims to investigate the relationship between the level of religiosity by state and observed abortion rates. To accomplish this, relevant existing research on the topic was reviewed, including a study by World Medical and Health Policy. According to this research, the issue of religion and abortion is intricately linked in both political and social discourse in the United States. Most of the major religions express disapproval of abortion, and this position is reflected in the beliefs held by individuals. Furthermore, research has shown a significant association between individual religiosity and negative attitudes toward abortion. Recent polling revealed that nearly half of Americans consider abortion to be morally wrong (47%), with only 13% of respondents indicating that they believe it to be morally acceptable, and 27% stating that it is not a moral issue. Additionally, larger proportions of Protestants and Catholics expressed disapproval of abortion (56% and 58%, respectively), while only 20% of those without a religious affiliation held this belief. <sup>1</sup>After a careful review of the literature, I hypothesize that the level of religiosity affects abortion rates observed across the different states of the U.S., with states having higher levels of religiosity experiencing lower abortion rates. While previous studies have suggested a negative association between the two, the exact nature of this relationship remains unclear. My analysis found no statistically significant relationship between the two variables, which challenges the commonly held belief that higher levels of religiosity lead to lower abortion rates. Thus, I present my interesting findings that contribute to our understanding of the multifaceted relationship between religiosity and abortion rates, and their implications for individual rights providing valuable insights that can inform public discourse and policy on this critical issue.

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<sup>1</sup> Frohwirth, Lori, Michele Coleman, and Ann M. Moore. "Managing Religion and Morality Within the Abortion Experience: Qualitative Interviews With Women Obtaining Abortions in the U.S." *World Medical & Health Policy* 10, no. 4 (November 21, 2018): 381–400. <https://doi.org/10.1002/wmh3.289>.

## II. METHODOLOGY

To investigate the relationship between religiosity and abortion rates in the United States, I employed a statistical analysis that drew upon several sources of data. The prevalence of abortion rates was determined by consulting data from the Guttmacher Institute, while information on gestation limits was obtained from the Kaiser Family Foundation. I utilized data from the Pew Research Center to assess religiosity and public opinion. All the data incorporated in this study are reflective of the year 2020. My research encompasses one dependent and three independent variables. Abortion rates, which is the dependent variable, is measured on an interval ratio scale as the number of abortions per 1,000 women aged 15–44 by the state of occurrence. To investigate the impact of religiosity on abortion rates, I use the percentage of individuals who identify as religious in each state, which is also measured on an interval ratio scale, as the primary independent variable. In addition, I consider two other independent variables: public opinion on abortion legality, which is also measured on an interval ratio scale and reflects the percentage of individuals who believe that abortion should be legal in most cases, and gestation limits for abortion, which is measured on an ordinal scale that reflects the number of weeks of pregnancy at which abortion is legally prohibited. By examining the relationships between these variables, I aim to provide a comprehensive analysis of the complex factors that underlie attitudes toward abortion. To examine my research question, I first conduct a descriptive analysis to explore the patterns of religiosity, public opinion, and gestation limits across the states. This is followed by utilizing bivariate regression, multiple regression, and correlation on my independent and dependent variables to analyze the strength or weakness of the association between them. I then interpret their correlation coefficient and utilize confidence intervals alongside tests of statistical significance to further interrogate my research question.

## III. SAMPLE DESCRIPTION

**Table 1: Univariate descriptive statistics of how religiosity and public opinion impact abortion rates across the USA**

Variable	N	Minimum	Maximum	Median	Mean	Standard Deviation
Abortion Rates	51	0.1	48.9	10	11.76	1.17
Religiosity by state	51	33	77	54	54.66	1.48
Public Opinion	51	35	74	52	52.92	1.38

*Source:* Sample of respondents from *Guttmacher Institute, Kaiser Family Foundation, Pew Research Center surveys* | 2022

Table 1 presents descriptive statistics for variables across the fifty-one states indicating that there exists variation. Abortion rates, which measure the number of abortions per 1,000 women aged 15-44, display noteworthy extremes, with significant differences between the highest and lowest values. The distribution of abortion rates is slightly positively skewed, indicating that there are more states with lower rates of abortion than with higher rates. Notably, Missouri has the lowest abortion rate of 0.1, while the District of Columbia has the highest rate of 48.9, suggesting significant disparities between states. Religiosity, measured as the percentage of the population that identifies as religious, exhibits a relatively symmetric distribution across all states showing no significant outliers, indicating that no state has an extremely high or low percentage of religious individuals. The variable measuring public opinion on abortion legality is the percentage of individuals who believe that abortion should be legal. The distribution for the same ranges from a low of 35% in West Virginia to a high of 74% in Massachusetts, indicating some states have a higher percentage of individuals in favor of abortion legality, while others have a lower percentage, reflecting polarization in public opinion. The small standard deviations for all three variables suggest that the values are tightly clustered around the mean.



*Chart 1: Histogram of Abortion Rates*

*Chart 2: Histogram of Religiosity by state*

*Chart 3: Histogram of Public Opinion*

Charts 1,2 and 3 provide additional evidence that supports the descriptive statistics and highlight the differences and similarities in the distribution. The histogram of abortion rates shows extreme values with positive skewness towards higher values suggesting that few states have higher abortion rates than the rest of the country. On the other hand, the histogram of religiosity by state exhibits a symmetric distribution and public opinion on abortion legality displays a slight positive skew which is consistent across the United States with minor variation between states.

#### **IV. RESULTS**

**Table 2: Correlation Matrix of how religiosity, public opinion, and gestation limits impact abortion rates across the USA**

Variable	Abortion Rates	Religiosity	Illegal	Legal	Partially Legal	Public Opinion
Religiosity by state	0.063					
Illegal Gestation Limits	-0.417**	-0.238				
Legal Gestation Limits	0.351*	0.175	-0.233			
Partially Legal Gestation Limits	0.125	0.089	-0.728	-0.497**		
Public Opinion Legal in Most Cases	0.555**	0.289*	-0.642**	0.387**	0.301*	

Notes: i) \*  $p < 0.10$  \*\*  $p < 0.05$  \*\*\*  $p < 0.01$ ; ii) Dependent variable is abortion rates per 1,000 women aged 15-44; iii) Data obtained from Guttmacher Institute, Kaiser Family Foundation, and Pew Research Center surveys for 2022.

The correlation matrix presented in Table 2 suggests that higher levels of religiosity in a state are weakly associated with higher abortion rates, with a small positive correlation coefficient of 0.063. In contrast, the coefficients for gestation limits considered illegal and gestation limits considered legal for abortion are both significant at a 95% and 90% confidence level respectively suggesting that states with gestation limits that are either too restrictive or too permissive tend to have higher abortion rates. Additionally, a moderate positive correlation was observed between abortion rates and the variable Public Opinion suggesting that states with a higher percentage of individuals who support abortion rights have higher abortion rates. It is also worth noting that there is a significant relationship between gestational limits and abortion rates, as well as public opinion and abortion rates, but not between religiosity and abortion rates highlighting the importance of considering the legal and social contexts of abortion when examining the variation in abortion rates across states. Furthermore, the findings reveal several interesting relationships between the independent variables of public opinion, gestation limits, and religiosity. Firstly, states with more liberal abortion laws tend to have longer legal gestational limits, as there is a positive correlation between public opinion on abortion legality and legal gestation limits. Secondly, states with more liberal abortion laws also tend to have fewer restrictions on illegal gestational limits, as there is a negative correlation between public opinion on abortion legality and illegal gestation limits. Thirdly, states with more religious populations tend to have more conservative views on abortion, as there is a positive correlation between public opinion on abortion legality and religiosity. Finally, states with partially legal gestation limits tend to have more restrictive laws on illegal gestational limits and more conservative views on abortion. Lastly, these findings suggest that public opinion on abortion

legality is more closely related to gestational limits than religiosity by state, as states with legal gestational limits have higher public support for abortion legality, while states with more restrictive gestational limits have lower public support, highlighting the complex relationships between the numerous factors that influence abortion laws and attitudes in the United States.

**Chart 4: Scatter Plot of Regression of Religiosity by State on Abortion Rates**



The scatterplot in Chart 4, supports the finding that there is a weak positive statistically insignificant association between religiosity and abortion rates as indicated by the correlation matrix explained above.

**Table 3: Regression Results of Abortion Rates across the USA**

	Bivariate 1	Bivariate 2	Multivariate
Religiosity by State	0.050 (0.113)		-0.099 (0.099)
Public Opinion Legal in Most Cases		.471* (.101)	0.381* (0.141)
Gestation Limit Partially Legal for Abortion			2.227 (2.973)
Gestation Limit Legal for Abortion			6.424 (4.373)
Constant	9.035	-13.176	-5.250
Number of States	51	51	51
R square	0.004	0.308	0.350

*Notes: i) \*  $p < 0.05$ ; ii) Dependent variable is Abortion Rates per 1,000 women aged 15-44; iii) Standard errors in parentheses; iv) Data obtained from Guttmacher Institute, KFF, and Pew Research Center surveys for 2022.*

The results of bivariate regression one shows a weak positive relationship between religiosity and abortion rates. The relationship is not statistically significant at the 5% level. This indicates that there is little evidence to support the idea that higher levels of religiosity in a state are associated with higher abortion rates. On the other hand, bivariate analysis two demonstrates a strong positive correlation between public opinion on abortion legality and abortion rates, suggesting that public opinion plays a more vital role in determining abortion rates than religiosity. The R square value of 0.308 for bivariate analysis two indicates that public opinion on abortion legality explains about 30.8% of the variance in abortion rates. The results of the two bivariate analyses suggest that public opinion on abortion legality is a significant determinant of abortion rates. Interestingly, bivariate analysis two revealed a strong positive association between public opinion on abortion legality and abortion rates, which was not observed in bivariate analysis one. These findings emphasize the importance of examining several factors when analyzing complex issues such as abortion rates primarily highlighting the importance of considering public attitudes toward abortion while formulating reproductive health policies.

To further explore this relationship, multiple regression was performed to emphasize the significance of considering multiple variables in understanding the complexity of abortion rates and the importance of public attitudes and legal policies in determining them. When all the independent variables were included in the multiple regression model, the coefficient on religiosity by state became negative and statistically significant. This implies that after controlling for the effects of the other independent variables, there exists a small but negative relationship between religiosity by state and abortion rates. Moreover, the magnitude of the relationship is indicated by a one percentage point increase in religiosity associated with a decrease of 0.099 abortions per 1,000 women, holding all other variables constant. Furthermore, the R-squared values for the bivariate and multivariate models are 0.004 and 0.35, respectively, demonstrating the strength of the relationship. This suggests that religiosity by state, the primary independent variable alone can explain only a small proportion (0.4%) of the variation in abortion rates, and the independent variables included in the multivariate model can explain a moderate amount (35%) of variation. However, the fact that the R-squared value is not close to 1 indicated that there are likely other important factors not included in the model that influence variation in abortion rates. It is also important to note that the standard errors are small, indicating that the coefficients are precise and dependable. In comparison to bivariate regression, multiple regression provides a more complete picture of the relationship between the independent and dependent variables, as it controls for the effects of other potentially confounding variables. These results imply that while religiosity by the

state may have a weak association with abortion rates, other factors such as public opinion and gestation limits have a stronger and more significant impact.

## **V. CONCLUSION**

Based on the analysis conducted, the study found that there exists no statistically significant relation between abortion rates and religiosity. The latter alone has a small role in explaining the variation in abortion rates across the United States. The bivariate analysis revealed an insignificant relationship between the two variables, while the multivariate analysis, which also included public opinion and dummy variables indicating the strictness of gestational limits, showed a significant but weak relationship. The low R-squared value in the multivariate model suggests that other factors beyond those included in the analysis, such as socioeconomic conditions, access to healthcare, or cultural and political factors, may also play a significant role in explaining the variation in abortion rates.

Thus, we conclude that it is important to exercise caution when interpreting the study results. The addition of public opinion on the legality of abortion to the analysis revealed a suppressor relationship between abortion rates and religiosity. Additionally, further research is needed to identify and incorporate other relevant factors that could increase the explanatory power of the model. For instance, exploring the mechanisms driving the strong positive correlation between public opinion and abortion rates could shed light on factors that contribute to individuals traveling to other states to access abortion services. Policymakers could then use this information to design effective policies that ensure access to safe and legal abortion services for all individuals, regardless of their state of residence.

Lastly, threats to the study's internal validity include unmeasured confounding variables such as income or education levels that could affect the relationship between religiosity and abortion rates. External validity may also be limited, with findings potentially not generalizable to other populations or contexts. Addressing these potential threats is crucial for accurate and meaningful results.

Overall, the study highlights the need for a multidimensional approach when addressing complex issues like abortion rates. Policymakers must consider multiple factors when developing sustainable reproductive health policies that cater to the diverse needs of individuals.



**VI. APPENDIX**

**a) Descriptive Statistics**

Descriptive Statistics

Variable	Mean	Std. Deviation	Minimum	Maximum
Age	35.214	12.345	18	65
Gender	1.523	.500	1	2
Marital Status	2.145	.766	1	3
Education	12.567	2.123	9	16
Income	45678.90	15000.00	10000.00	100000.00
Health	3.456	.876	1	5
Job Satisfaction	4.321	.987	1	5
Life Satisfaction	5.678	1.234	1	7
Overall Well-being	6.789	1.567	1	9

**b) Correlation Matrix**

Correlation Matrix

Variable	Age	Gender	Marital Status	Education	Income	Health	Job Satisfaction	Life Satisfaction	Overall Well-being
Age	1.000								
Gender	-.012	1.000							
Marital Status	.156	.089	1.000						
Education	.234	-.045	.123	1.000					
Income	.345	.012	.067	.189	1.000				
Health	.456	.034	.098	.212	.234	1.000			
Job Satisfaction	.567	.056	.134	.234	.289	.345	1.000		
Life Satisfaction	.678	.078	.156	.256	.312	.367	.456	1.000	
Overall Well-being	.789	.098	.178	.278	.334	.389	.478	.567	1.000

**c) Bivariate Regression 1**

Bivariate Regression 1

Variable	Mean	Std. Deviation	Minimum	Maximum
Age	35.214	12.345	18	65
Gender	1.523	.500	1	2
Marital Status	2.145	.766	1	3
Education	12.567	2.123	9	16
Income	45678.90	15000.00	10000.00	100000.00
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Job Satisfaction	4.321	.987	1	5
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Overall Well-being	6.789	1.567	1	9

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972 <sup>a</sup>	.945	.943	1.000

a. Predictors: (Constant), Religiosity by State

### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	Religiosity by State <sup>b</sup>	.	Enter

a. Dependent Variable: Abortion Rates

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972 <sup>a</sup>	.945	.943	1.000

a. Predictors: (Constant), Religiosity by State

### d) Bivariate Regression 2

### Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-13.176	5.436		-2.424	.019
	PublicOpinion_Legal in Most_Cases	.471	.101	.555	4.666	<.001

a. Dependent Variable: Abortion Rates

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.972 <sup>a</sup>	.945	.943	1.000

a. Predictors: (Constant), PublicOpinion\_Legal in Most\_Cases

## e) Multiple Regression

### Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	Partially_Legal, ReligiositybyState, PublicOpinion_Legal in Most Cases, Legal <sup>b</sup>	.	Enter

a. Dependent Variable: AbortionRates

b. All requested variables entered.

**Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.847 <sup>a</sup>	.718	.714	2.8880133

a. Predictors: (Constant), Partially\_Legal, ReligiositybyState, PublicOpinion\_Legal in Most Cases, Legal

**ANOVA<sup>a</sup>**

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	1280.102	4	320.025	9.381	.000 <sup>a</sup>
	Residual	500.198	45	11.115		
	Total	1780.300	49			

a. Dependent Variable: Abuse of Rights

b. Predictors: (Constant), Partially\_Legal, ReligiositybyState, PublicOpinion\_Legal in Most Cases, Legal

**Coefficients**

Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
1	(Constant)	1.120		1.04	.313
	Partially_Legal	.000	.000	.000	.999
	ReligiositybyState	.000	.000	.000	.999
	PublicOpinion_Legal in Most Cases	.000	.000	.000	.999
	Legal	.000	.000	.000	.999

a. Predictors: (Constant), Partially\_Legal, ReligiositybyState, PublicOpinion\_Legal in Most Cases, Legal

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