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# Gunning for Gun Control: A State by State Analysis of the Effects of Gun Control Policies on Firearm Mortality Rates

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Eastern Kentucky University

Gunning for Gun Control: A State by State Analysis of the Effects of Gun Control  
Policies on Firearm Mortality Rates

Honors Thesis  
Submitted in Partial Fulfillment of the Requirements of HON 420  
Fall 2017

By  
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Mentor:  
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School of Justice Studies

## **Abstract**

### **Gunning for Gun Control: A State by State Analysis of the Effects of Gun Control Policies on Firearm Mortality Rates**

Jade Robinson

Mr. Gregory Ferrell

Gun control is not a new concept; however, due to the growing amount of supporting non profits and recent mass shootings, gun control is becoming a common topic both amongst researchers and the general public. Currently, gun control is a state issue and thus should be studied on a state by state basis. This study examines state gun control policies and firearm mortality rates to determine if there is a correlation between gun control policies and the firearm mortality rate. The years covered by this study were 2000-2014 and nine states were sampled. Two out of the nine states were found to have a statistically significant negative correlation between the gun control and the firearm mortality rate. Confounding variables were also studied for each state that was found to support the hypothesis such as demographics and the economics of each state. Further research still needs to be done to determine the cause and effects of firearm violence as well as possible prevention strategies.

*Key words:* thesis, gun control, mortality rate, undergraduate research, firearm legislation

**Table of Contents**

<b>LITERATURE REVIEW .....</b>	<b>5</b>
<b>SHALL ISSUE .....</b>	<b>5</b>
<b>BANS.....</b>	<b>6</b>
<b>STAND YOUR GROUND/CASTLE DOCTRINE .....</b>	<b>7</b>
<b>BACKGROUND CHECKS .....</b>	<b>7</b>
<b>LICENSING OF DEALERS.....</b>	<b>8</b>
<b>MANDATORY THEFT REPORTING .....</b>	<b>10</b>
<b>METHODS.....</b>	<b>10</b>
<b>RESULTS.....</b>	<b>15</b>
<b>KANSAS .....</b>	<b>16</b>
<b>LOUISIANA .....</b>	<b>18</b>
<b>MASSACHUSETTS.....</b>	<b>20</b>
<b>MISSISSIPPI.....</b>	<b>22</b>
<b>NEW MEXICO .....</b>	<b>25</b>
<b>NORTH CAROLINA.....</b>	<b>28</b>
<b>OREGON.....</b>	<b>30</b>
<b>PENNSYLVANIA.....</b>	<b>33</b>
<b>WISCONSIN .....</b>	<b>36</b>
<b>DISCUSSION .....</b>	<b>40</b>
<b>REFERENCES.....</b>	<b>46</b>

## List of Figures

Table 1: Gun Control Policy Coding .....	13
Table 2: Kansas Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	17
Table 3: Louisiana Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	19
Table 4: Massachusetts Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	22
Table 5: Mississippi Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	24
Table 6: New Mexico Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	27
Table 7: North Carolina Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	30
Table 8: Oregon Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	32
Table 9: Pennsylvania Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	35
Table 9: Wisconsin Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy.....	38
Table 10: Demographic Factors that Influence both Mortality and Crime Rate .....	41

## List of Tables

Table 1: Gun Control Policy Coding .....	13
Table 2: Kansas Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	17
Table 3: Louisiana Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	19
Table 4: Massachusetts Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	22
Table 5: Mississippi Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	24
Table 6: New Mexico Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	27
Table 7: North Carolina Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	30
Table 8: Oregon Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	32
Table 9: Pennsylvania Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	35
Table 9: Wisconsin Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy .....	38
Table 10: Demographic Factors that Influence both Mortality and Crime Rate .....	41

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In 2016, at the time of this study, 486 people have died due to mass shootings in America and 1,558 people have been wounded. (Massshootingtracker.org, 2016) In 2013, there were 32,888 individuals who died due to a firearm related injuries (Cerda, 2016). Not only are people dying at alarming rate due to gun violence, this also greatly effects the United States' economy. In 2013, firearm injuries accounted for \$229 billion due to costs spent on health care, criminal justice, loss of income, pain, suffering, and lost quality of life (Cerda, 2016). These numbers are not unique for the year and are viewed as just another part of living in America by many. The gun violence mortality rate in the United States is higher than any other industrialized nation. Many developed nations, such as Australia and England, that have experienced mass shootings implemented stricter legislation after one major incident (Goss, 2003). After many incidents of mass shootings, the United States has failed to enact any meaningful legislation.

A common public opinion is that gun control is a relatively new controversial topic that has become a concern after the millennial generation was established. However, this is not the case. In 1865, President Abraham Lincoln was shot by a confederate supporter

with a derringer pistol. Another popular and beloved president, John F. Kennedy, was shot and killed by Lee Harvey Oswald using a military rifle in 1963. In April 1968, Martin Luther King Junior was fatally shot by James Earl Ray using a Remington rifle. In June 1968, Senator Robert F. Kennedy was killed by a .22 caliber pistol at a hotel in Los Angeles. In 1981, Ronald Reagan was almost assassinated. This list of major killings throughout the years is not comprehensive and could be much longer. Political leaders were not the only targets of gun violence. Many incidents have occurred in schools, universities, and churches throughout the years as well (Goss, 2003).

After all of these tragic events throughout the country, one would imagine that firearm regulation legislation would be quickly passed. There was some legislation developed during the period of history riddled with assassinations of political leaders. A subcommittee was formed in the early 1960s and this was followed with the formation of the Dodd Bill. The Dodd bill would have “required people wishing to purchase concealed guns by mail to provide a notarized statement that they were over 18, that they were not a convicted felon, and that the purchase would not violate state or local gun laws.” (Goss, 2003) However, this bill received some backlash and was not passed. In 1975, after the attempted assassination of President Gerald R. Ford, the house’s new subcommittee on crime deemed gun control legislation as the “most urgent” priority. Representative Conyers attempted to pass a bill that banned handguns and then compromised in order to help the bill pass. However, this bill also did not pass. After John Lennon was assassinated and mass shootings occurred in California, Texas and New York, the Bush

Administration barred imports of 43 assault weapons. The bill passed and became law in 1994. However, this law expired in 2004 (Goss, 2003 and Lemieux 2014).

The Brady Handgun Violence Prevention Act was also passed in 1994 and is still in effect today. This act requires federally licensed firearm dealers to complete background checks for each sale of a firearm. A person is deemed to be disqualified if “he or she is under indictment or convicted of a crime punishable by more than 1 year in prison, is a fugitive from justice, is unlawfully a user of a controlled substance, has been adjudicated as a mental defective or committed to a mental institution, was dishonorably discharge from the armed services, has renounced U.S. citizenship, is subject to a restraining order, or has been convicted of domestic violence” (Sumner and and Layde 2008).

History repeats itself and this is true in terms of mass shootings and gun control as well. In 2012, in Newton, CT, 26 people were killed including 20 children. This was done using an assault rifle with high capacity magazines along with two handguns. The white house, under the Obama administration, assembled a task force and introduced new proposals. However, once again, no new legislation was passed on a federal level (Wing, 2015).

At the state level, many types of gun legislation was passed. Since Newton, 39 states have passed 117 new provisions that strengthen their gun control laws and 70 laws have been passed to weaken gun control. Gun control is a state by state issue due to the influence of powerful political organizations such as the NRA and the lack of organizations willing to dedicate their time, research, and funds to pro gun control

advocacy measures at the federal level. States' gun control laws vary by state and all have different components. There are many different types of gun control laws, and a few have been researched extensively. Due to the US government not funding gun research, objective information is limited, however the findings of unfunded research are powerful despite the limitations of the studies. One question that studies try to answer is the effect of state gun control policies on firearm mortality rates. There were few studies done on mortality rate as a whole and multiple studies were completed on homicide and suicide rates. These were included in the literature review due to firearm mortality rate being an encompassing term for both homicide and suicide and unintentional deaths. I hypothesize, due to the former research and theories, that as state gun control policies become stronger, the firearm mortality rate will decrease. There are multiple different types of gun control policies and issues surrounding the concept of gun control. Multiple types of regulations and issues will be discussed within this study.

## **Literature Review**

### **Gun Control Laws Targeting Firearm Usage**

#### **Shall Issue**

In 1987, Florida became a shall issue state. The ten years following Florida issuing this legislation included 21 other state passing shall issue legislation. Shall issue entails the local official issuing a permit to anyone who meets basic requirements. This replaces may issue laws which give the local official the discretion to reject most applications (29 Hamline L. Rev. 637 and Kovandzic and Marvell 2005). Shall Issue legislation is very

controversial due to supporters believing that allowing citizens to carry a firearm prevents potential criminals from committing a crime because they are afraid to encounter an armed citizen. Opponents believe that certain situations are more prone to turn fatal due to the presence of a firearm (Kovandzic and Marvell 2005). Lee and Mustard (1997) conducted a controversial study and found that shall issue laws were negatively associated with violent crime rates. Kovandzic and Marvell readdressed this study, along with other researchers, and found that by using time trend variables, and not dummy variables, shall issue laws were actually negatively associated with violent crime rates (Kovandzic and Marvell, 2005 and Aryes and Donohue, 2003).

### **Bans**

The 1994 Federal Assault Weapons ban was in place for ten years, from 1994 to 2004. This ban prohibited certain names and types of assault military style weapons that were commonly used by criminals. The ban also prohibited most large-capacity ammunition devices (Koper and Roth, 2001). Koper and Roth found no association between the federal assault weapons ban and homicide rate. (Santealla-Tenoria, 2016 and Guis, 2013). However, Koper and Roth did explain that due to the study being completed in 2001, their work might have been too premature to determine the true effects of the ban (Koper and Roth, 2001). Gius completed a recent study focusing on state homicide rates during 1994 and 2004 and found that the federal assault weapons ban also found no association between the federal assault weapons ban and homicide rate (Santaella-Tenoria, 2016 and Guis, 2013).

### **Stand Your Ground/Castle Doctrine**

Stand your ground laws remove the duty to retreat in one's own home and allow a citizen to use self defense (Santaella-Tenoria, 2016 and Lott, 1997 and Lemieux, 2013). These laws initially aim at preventing the escalation of violence. Stand your ground laws, or Castle Doctrine, have also recently expanded to public places rather than limiting self defense to home only (Lemieux, 2013). Lott found that castle doctrine laws were associated with a 9% reduction in homicide rates (Santaella-Tenoria, 2016 and Lott, 1997). However, Cheng and Hoekstra in 2013 found that castle doctrine laws were associated with a 6%-11% increase (Santaella-Tenoria, 2016 and Cheng and Hoekstra, 2013). Most studies show that stand your ground laws increase the rate of homicides (Santaella-Tenoria, 2016).

### **Laws Targeting Sales**

#### **Background Checks**

States with less stringent background checks have been associated with more firearm homicides (Santaella-Tenoria, 2016, Panjampiom, 2012, and Ruddell, 2005). Proper background checks need to measure the state's ability to screen for prior convictions, fugitives, and mental health capacity that could be on their record. In order to attack both felons with long records and illegal firearm distributors, background checks need to be utilized for both unauthorized users and the distributors themselves (Panjampiom, 2012 and Ruddell, 2005). Waiting periods have been created by the Brady Handgun Violence Prevention Act which was implemented in 1994. There is a wait period for individuals

who want to buy a handgun and who are waiting to get their background check approved. Therefore, if they were trying to commit an illegal act, they would thus have a cool down period and be able to rethink their actions and this lowers the firearm violence rate (Panjampiom, 2012 and Ruddell, 2005). However, Lott and Mustard found no association between waiting periods and homicide rates at the state level (Santaella-Tenoria, 2016 and Lott and Mustard, 1997).

Another aspect of background checks is that a permit holder in shall issue states do not have to receive another background check when purchasing a handgun as long as the state's system is equal to the NICS background checks required under Brady law (29 Hamline L. Rev. 637, Brady Handgun Control Act, 1994, FBI 2015). These background checks are also not always completed properly. Budgetary constraints occur at the state and local agencies who conduct background checks and do not have the necessary data to conduct a complete search. Local law enforcement agencies have been found to have the access to the most records and complete the most detailed and effective check (Sumner and Layde, 2008). Sumner and Layde suggested that it would be beneficial for states to allocate more resources to permit local law enforcement to conduct background checks at the local level with access to federal databases (2008).

### **Licensing of Dealers**

Each person in the business of selling firearms must obtain a federal firearm dealer's license. However, there are loopholes to this law as an individual can claim they only sell guns "occasionally" and they do not have to be federally licensed. The ATF only requires



one routine inspection of firearm dealers per year. Federal laws also make it difficult to revoke the license of problem dealers. State licensure allows the opportunity to impose more rigorous criteria and sanctions (Vernick and Webster, 2006 and Wintemute 2007). Vernick and Webster recommended the states to license firearm dealers due to the problems surrounding federal licensure of firearm dealers (2006). Licensed “problem” firearm dealers and gun shows are huge contributors to gun violence due to the amount of criminals gaining access to firearms from these sources. (Vernick and Webster, 2006 and Wintemute 2007). The study completed by Wintemute in 2008 titled “*Gun shows across a multistate American gun market: observational evident of the effects of regulatory policies*” analyzed gun shows in California, a state licensure state, and Nevada, Arizona, Texas and Florida which all do not have state licensure of firearms dealers. Armed attendees, that could personally sell their own guns they brought, were found to be more common in other states than California. One straw purchase occurred in California while 24 definite straw purchases occurred elsewhere. The number of attendees per gun vendor was higher in California (Wintemute, 2008) This study was monumental due to the findings that firearms could be more regulated and not decrease purchases or attendees to gun shows. Other studies, such as Irvin et al. found that state licensing requirements for dealers were associated with firearm homicide reductions (2014). Irvin et al. also found that lower homicide rates were associated with states that 3 or more laws regulated firearm dealers (2014).

### **Mandatory Theft Reporting**

Only six states out of the United States require mandatory theft reporting to local authorities. The 2006 study completed by Vernick et al. on firearm dealers found that “State reporting of thefts...can allow local officials to act more quickly to potentially minimize the harm associated with guns directly entering the illicit market.” Irvin et al found that state mandatory theft reporting was not associated with lower homicide rate (2014).

### **Methods**

#### **Sampling**

Multistage sampling was chosen as the selection method. A state was chosen from each United States Census Bureau regional division. These states were chosen through random sampling. All of the states for a division were written on individual slips of paper and one was randomly selected. This process was used for each selection. Nine states total were chosen.

Massachusetts was chosen from the North East Region and New England Division. Pennsylvania was chosen from the North East Region and Middle Atlantic Division. Wisconsin was chosen from the Midwest Region and East North Central Division. Kansas was chosen from the Midwest Region and West North Central Division. North Carolina was chosen from the South Region and South Atlantic Division. Mississippi was chosen from the South Region and East South Central Division. Louisiana was chosen from the South Region and West South Central Division. New Mexico was chosen from

the West Region and Mountain Division. Oregon was chosen from the West Region and Pacific Division.

### **Data Sources**

The mortality rates for years 2000-2014 for each selected state were collected from the Center for Disease Control and Prevention Wonder Database (WONDER). The specific WONDER database used was the “Underlying Cause of Death” detailed mortality database. All states were selected when information was gathered from the database and each time information was gathered, it was for a different year. For example, for year 2000, all nine states were selected and the mortality rate was shown for each state for year 2000. The Center for Disease Control and Prevention uses ICD-10 Codes to code their causes of death. 9 different causes of death were used when collecting the mortality rate of firearms by year for each state. The following are the codes included in the current study: Code W32 titled “Exposure to inanimate physical force of Handgun discharge, Code W33 titled “Exposure to inanimate physical force of Rifle, shotgun, and large firearm discharge, Code W34 titled “Discharge from other and unspecified firearms, Code X93 titled “Assault by handgun discharge”, Code X94 titled “Assault by rifle, shotgun, and larger firearm discharge”, Code X95 titled “Assault by other and unspecified firearm discharge”, Code Y22 titled “Handgun discharge, undetermined intent”, Code Y23 titled “Rifle, shotgun, and larger firearm discharge, undetermined intent, and Code Y24 titled “Other and unspecified firearm discharge, undetermined intent”.

The Gun Control Policy qualitative data was collected from “U.S. State and Local Public Policies in 2006: A New Database” which was created by Dr. Ruger and Dr. Sorens, professors at Texas State University and Dartmouth college, respectively. This database had coded each state’s gun control policies from 2000-2014 in two year intervals with no coding occurring at 2002 and 2004. The professors were contacted to determine why the data was not collected in 2002 and 2002 and Dr. Sorens stated that no time or money was available to collect data for those years. Dr. Sorens also stated that data about gun control policy for the year 2000 was only conducted to have a year farther in the past. I collected qualitative data from this coding and spreadsheet and only collected the gun control policies that I deemed important and significant due to my previous literature review.

### **Coding Strategy**

Quantitative data was collected for each state and for each year available from the spreadsheet which was 2000,2006,2008,2010,2012, and 2014. The changes in policy from year to year for each state were tracked and collected. After the qualitative data was collected, the gun control laws/policies totaled to 34. A coding system was created with 34 possible points possible (See Table 1). If a state had 34/34 points, that state would have extremely strong gun control policies. If a state had closer to 0/34 points, that state would have extremely weak gun control. Each policy was color coded red, green, or yellow to determine its effect on the amount of points that state would receive. Red was not given a point because it was deemed to be a weak gun control policy. Green was

given a point because it was deemed to be strong gun control policy. Yellow was given a 0.5 point, either negative or positive, depending on if it was slightly weak or a slightly strong gun control policy. These points were tracked per year and these points were the quantitative data for gun control policy. If it was unclear as to when the gun control policy had changed, and thus when that state's gun control points would change, the date that particular statute went into effect was researched and the change points reflect the change in policy. The table below shows how the policies were coded to determine the score for each state per year

**Table 1: Gun Control Policy Coding**

Policy	Coding
Concealed carry permits issued to residents	Add a point if issued to residents
Concealed carry permits issued to nonresidents	Add a point if issued to nonresidents
May issue, shall issue, or neither	Add a point if may issue, add 0.5 point if shall issue
Loaded handgun carry allowed with permission or not allowed	Add a point if not permitted without permission
Firearm in vehicle policy	Add a point if firearm is only legal with concealed carry permit and must be in glove box, add half a point if permit not necessary but must be in locked container
State preemption of open carry/concealed carry ordinances	Add a point if state preemption in both categories, add half a point if state preemption in either concealed/open carry ordinances
Assault weapons ban	Add a point if assault weapons ban is in place
Large capacity ammunition magazines ban	Add a point if large capacity magazines ban is in place
50 caliber rifles banned/regulated	Add a point if 50 caliber rifles are banned, add half a point if regulated

Non powder guns use or possession regulated or not regulated	Add a point if non powder guns use is regulated
Minimum age standard stricter than federal standard or set at federal standard	Add a point if minimum age is stricter than federal standard
Waiting period on firearms purchases	Add a point if waiting period for firearms purchases is in place, add half a point if waiting period is in place in some jurisdictions
Restrictions on multiple purchases or sales of firearms	Add a point if restrictions are in place
Gun dealers regulated and licensed	Add a point if gun dealers are licensed and/or regulated
Regulations for gun dealers to report stolen firearms	Add a point if gun dealers are required to report all stolen firearms
Firearm store security precautions in place	Add a point if security precautions are required
Police inspections for firearm store	Add a point if required, add half a point if permitted
Owner requirement to report lost or stolen guns	Add a point if owners are required to report
Background checks at private sales/gun shows	Add a point if background checks are required
Licensing/permits for all gun owners and purchases	Add a point if required
Safety training in place for getting a permit	Add a point if required
Registration for firearms	Add a point if required
Design safety standards (no Saturday night specials)	Add a point if in place
Built in locking devices	Add a point if required
Authorized requirement for new handguns	Add a point if required
Ballistic identification requirements	Add a point if in place
Ammunition microstamping	Add a point if required
Law specifying no duty to treat before using deadly force, castle doctrine	Add a point if no law in place, give half a point if law applies only to home, add zero points if law is in place
Retention of sales records kept	Add a point if kept by state, add half a point if kept by seller

State constitution contains right to keep and bear arms	Add a point if NOT in constitution
Machine guns	Add a point if banned, add half a point if regulated
Sound silencers	Add a point if banned, add half a point if regulated
Short barreled rifles/shotguns	Add a point if banned, add half a point if regulated
AOW	Add a point if banned, add half a point if regulated

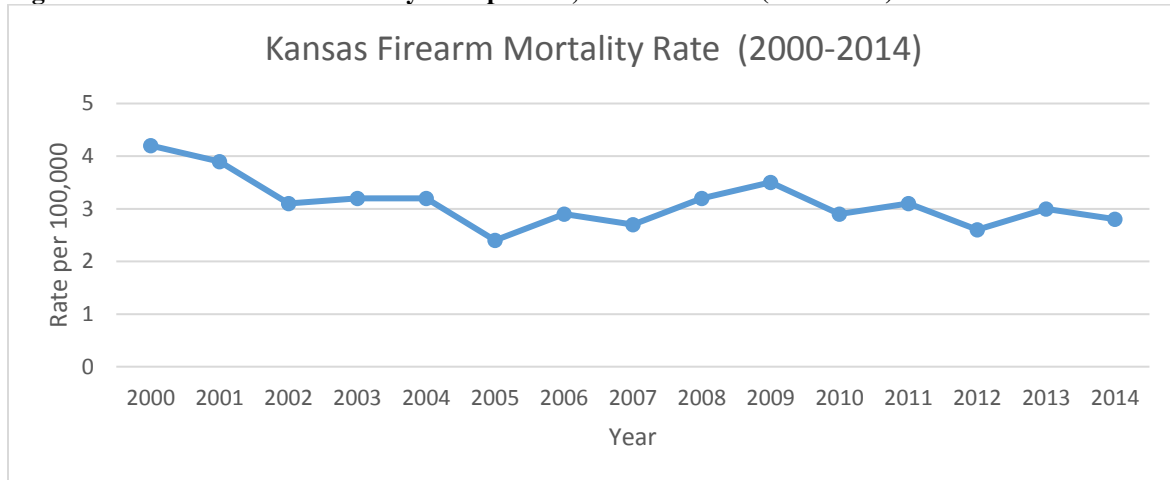
The gun control policy points for each state per year (2000-2014) were compared to the Firearm Mortality rates for each state per year (2000-2014). These two variables were compared using SPSS 23, a statistics software and a Pearson correlation test was performed on the two variables to deem if the two variables correlated and if that correlation was statistically significant.

### **Results**

The firearm mortality rates were tracked over the years 2000-2014 and how the rates changed over time. The gun control policies were tracked over the years 2000-2014 and how the quantitative scoring system changed by year for each state.

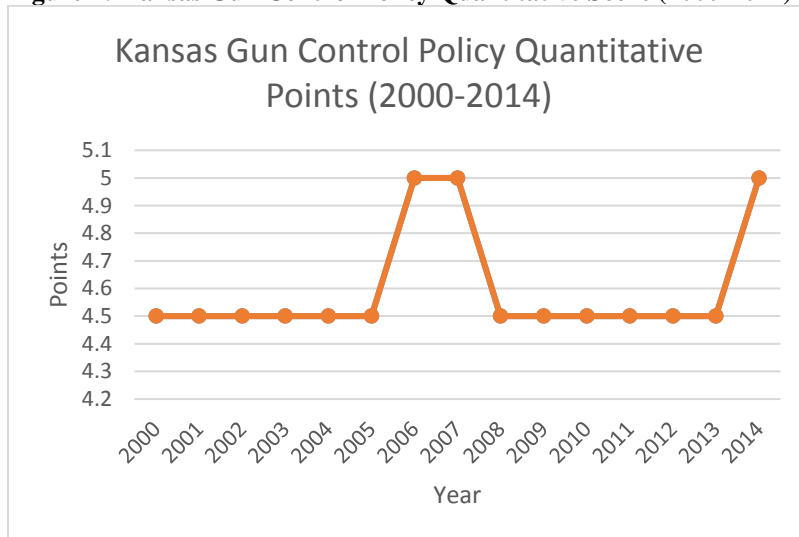
**Kansas**

**Figure 1: Kansas Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



Kansas started with a rate of 4.2 deaths due to firearms per 100,000 individuals and ended with a rate of 2.8 deaths due to firearms per 100,00 individuals. This is a generally negative relationship amongst the increase in years and the firearm mortality rate.

**Figure 2: Kansas Gun Control Policy Quantitative Score (2000-2014)**



The state of Kansas was given a score of 4.5 points out of 34 points in 2000. Kansas did not allow loaded handgun carry in all places besides safe zones without permission. Kansas did not have a law specifying no duty to retreat before using deadly force. Kansas



had retention of sales records kept by the seller in a few jurisdictions. The state constitution does not have the individual right to bear arms. Machine guns are prohibited. (Rugers and Sorens, 2015) In 2006, Kansas started to require concealed carry permits and those were issued by state. Kansas also became a shall issue state. However, a law was passed specifying there was no duty to retreat before using deadly force in the home. There was also no longer a requirement by any jurisdictions to keep sale records of firearms. In 2008, Kansas now had state preemption of local concealed carry ordinances. However, machine guns were no longer prohibited. In 2012, state preemption of open carry ordinances also went into effect. The castle doctrine, or the law specifying no duty to retreat before using deadly force was changed from only occurring in home to now applying everywhere. This law was changed back to in home only in 2014 (Ruger and Sorens, 2016). These changes in policies are reflective of the amount of points that Kansas had per year studied. Kansas overall scored relatively low with a high of 5 points of 34 possible points.

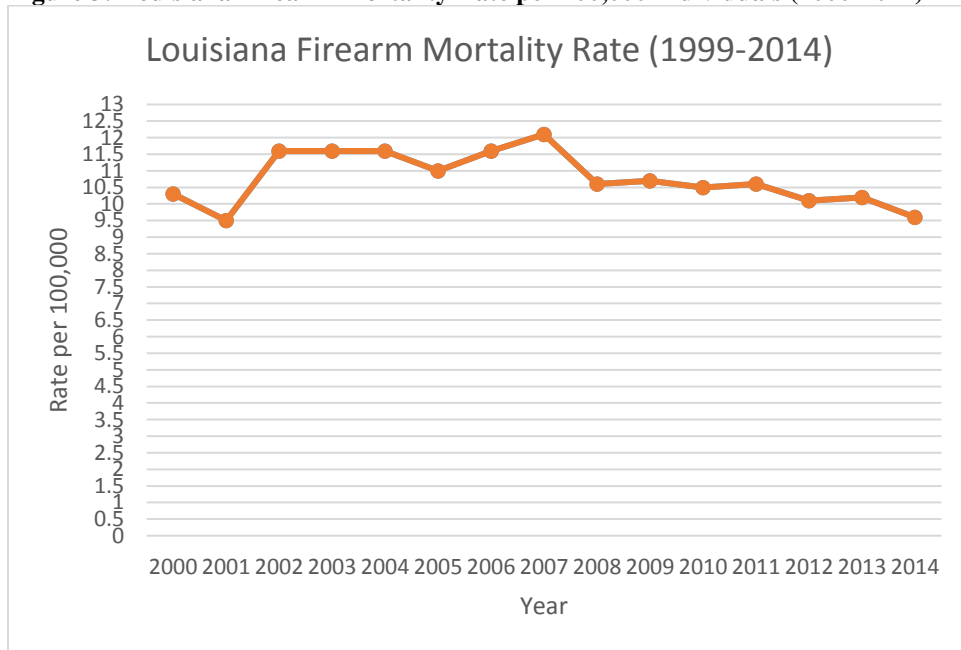
Table 2: Kansas Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

		<b>Correlations</b>	
		CrimeType	Policy
CrimeType	Pearson Correlation	1	-.344
	Sig. (2-tailed)		.210
	N	15	15
Policy	Pearson Correlation	-.344	1
	Sig. (2-tailed)	.210	
	N	15	15

Kansas' Firearm Mortality Rate and Gun Control Policy were negatively correlated according to the Pearson Correlation test. ( $R = -.344$ ) However, this correlation is not statistically significant due to the P value being above .05 with  $P = .210$ .

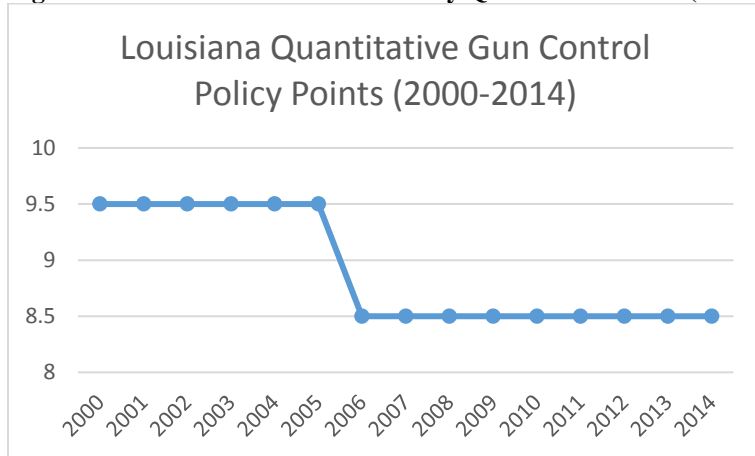
**Louisiana**

**Figure 3: Louisiana Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



Louisiana started with a mortality rate of 10.5 deaths per 100,00 inhabitants in the year 2000. In 2014, Louisiana had 10.1 deaths per 100,000 inhabitants. There does not seem to be any particular trend.

**Figure 4: Louisiana Gun Control Policy Quantitative Score (2000-2014)**



Louisiana was given a score of 9.5 points in 2000. Louisiana issued concealed carry permits to residents and was a shall issue state. The state did not allow loaded handgun carry in all places besides safety zones without permission. There was some state preemption in both open and concealed carry ordinances. There was an assault weapons ban. There is a stricter minimum age to purchase than federal standard. The gun owners are required to report lost or stolen guns. And some firearms need to be registered. There were no laws specifying no duty to retreat before using deadly force. Machine guns, sound silencers, short barreled rifles, short barreled shotguns, and AOWs are all regulated but not completely prohibited. In 2006, a law specifying no duty to retreat before using deadly force was passed causing the decrease in the quantitative score. There were no changes occurring in gun control policies that were studied in the remaining years between 2006 and 2014 causing the amount of points to stay at 8.5 points of 34. This score is relatively low and thus Louisiana has relatively weak gun control policies.

Table 3: Louisiana Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

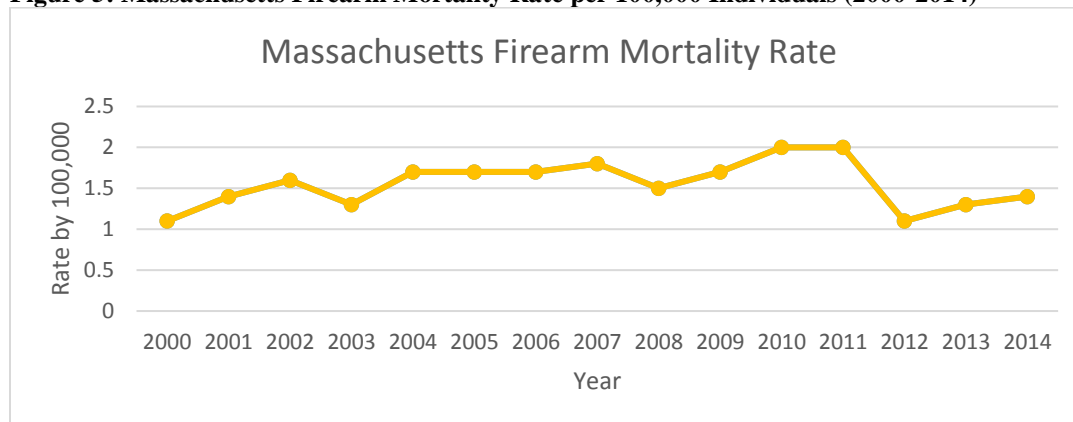
**Correlations**

		Policy	Crrate
Policy	Pearson Correlation	1	.137
	Sig. (2-tailed)		.627
	N	15	15
Crrate	Pearson Correlation	.137	1
	Sig. (2-tailed)	.627	
	N	15	15

Firearm mortality rate and Gun Control Policy had a Pearson correlation of  $R=.137$ . However, this correlation is deemed to be not statistically significant due to the P value being above 0.05 at  $P=.627$ .

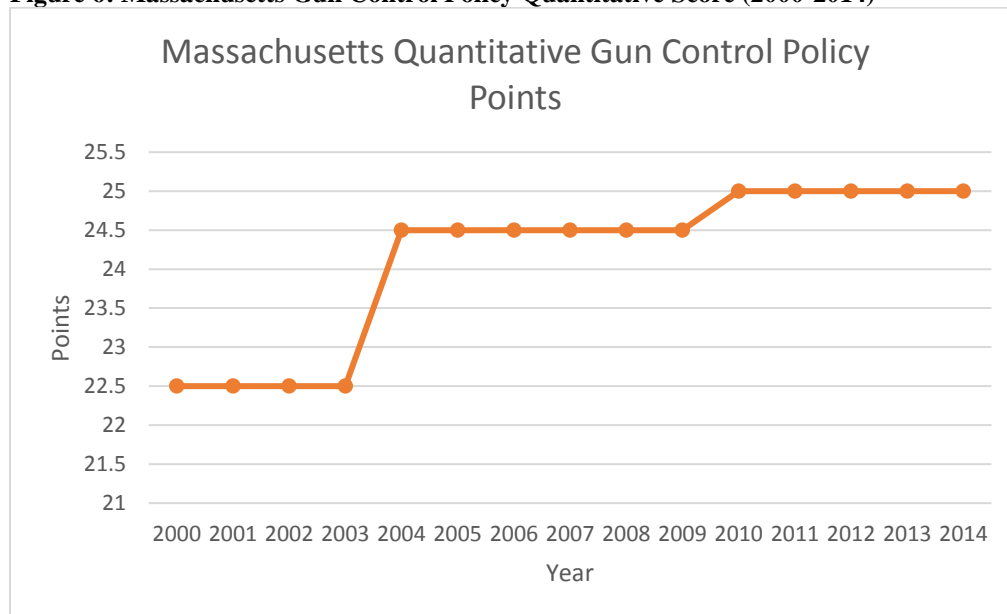
### Massachusetts

**Figure 5: Massachusetts Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, Massachusetts had a firearm mortality rate of 1.1 per 100,000 inhabitants. In 2014, Massachusetts had a firearm mortality rate of 1.4 per 100,000 inhabitants. There does not seem to be any form of trend, however, a noticeable spike did occur in 2010.

**Figure 6: Massachusetts Gun Control Policy Quantitative Score (2000-2014)**



The state of Massachusetts was given a score of 22.5 for its' gun control policies in the year 2000. Massachusetts issued concealed carry permits to its' residents as well as its' non residents. Massachusetts was a may issue state. It did not allow loaded handgun carry without permission in all zones besides safety zones. Massachusetts only allowed a firearm in a vehicle if one had a concealed carry permit and the firearm was in a locked container or a glove box. There was an assault weapons ban in place. Non powder guns use and possession was regulated. Massachusetts had a stricter minimum age to purchase a gun than the federal standard. Licensing and regulation of gun dealers were in place. Store security precautions were required. Police inspections are required for gun stores. Owners are required to report lost or stolen guns. Background checks are required at private sales and gun shows. Licensing and permits are required for all guns for gun owners as well as purchasers. Design safety standards are in place. Built in locking devices are required and gun must be stored in locked container or with lock in place. There is a law specifying no duty to retreat before using deadly force but this law only applies to in the home. Retention of sales records are kept by the state. The state constitution does not contain individual right to keep and bear arms. Machine guns, sound silencers, short barreled rifles, short barreled shotguns, and AOW's are regulated but not prohibited. In 2006, a large capacity ammunition magazines ban was now in place. Also in 2006, a permit is now required by sale and that permit requires a background check. In 2010, machine guns were prohibited entirely. No differences occurred after 2010 until 2014.

Massachusetts consistently had the highest amount of points for Gun Control Policy scoring 25 out of 34 possible points. Massachusetts had the strongest gun control policies out of all the states studied.

Table 4: Massachusetts Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

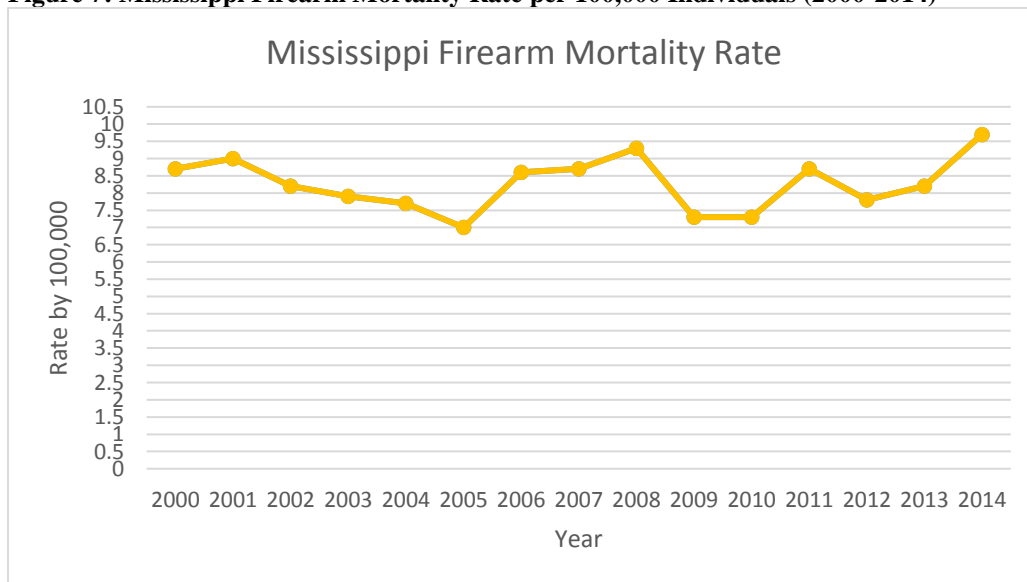
**Correlations**

		CrmRate	Policy
CrmRate	Pearson Correlation	1	.395
	Sig. (2-tailed)		.145
	N	15	15
Policy	Pearson Correlation	.395	1
	Sig. (2-tailed)	.145	
	N	15	15

For Massachusetts, from the years 2000-2014, there was a Pearson correlation of  $R=.395$  between the two variables of Gun Control Policy and Firearm mortality rate. This correlation is not statistically significant due to the P value being above at .05 at  $P=.145$ .

**Mississippi**

**Figure 7: Mississippi Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, Mississippi had a firearm mortality rate of 8.7 per 100,000 individuals. In 2014, Mississippi had a firearm mortality rate of 9.7 per 100,000 individuals. There was a negative trend from years 2000 to 2005 with a generally positive trend from years 2006 to 2014.

**Figure 8: Mississippi Gun Control Policy Quantitative Score (2000-2014)**



Mississippi was given a score of 8.5 points out of 34 possible points for its' gun control policies in 2000. Mississippi issued concealed carry permits to both residents and non residents. It is a shall issue state. The state did not allow loaded handgun carry without permission in all areas except safe zones. The state allowed complete peaceable journey so a firearm could be in plain sight in a vehicle without a permit. There was some state preemption of local open carry ordinances and some state preemption of local concealed carry ordinances. There was not an assault weapons ban, no large capacity ammunition magazines ban, and 50 caliber rifles were not banned are regulated. Non powder gun use and/or possession is regulated. There was not a stricter minimum age to purchase or possess a firearm than a federal standard. There was not a waiting period on firearms purchases. There were not restrictions on multiple purchases of firearms. There is no licensing or regulation of gun dealers. There was no gun dealer mandatory theft

reporting. There were not firearm store security precautions. Police inspections of gun stores were permitted but not required. Owners were not required to report lost or stolen guns. Background checks were not required at private sales or gun shows. Licensing or permitting of gun owners or purchasers are not required. There was not a safety training in place for licensees/permittees. There is no registration required for firearms. There are no design safety standards for handguns. There were no built in locking devices required. There were no ballistic identification requirements in place. There was not a law specifying no duty to retreat before using deadly force. Retention of sales records were kept by state. Mississippi's state constitution contains the individual right to keep and bear arms. Machine guns, sound silencers, short barreled rifles, short barreled shotguns, and any other third class weapon are all not prohibited or strictly regulated.

In 2006, sound silences were now regulated at the state local level but not prohibited. Mississippi received a score of 9 out of 34 possible points in 2006. There were no changes until 2010 when Mississippi required a stricter age requirement than federal standard in order to own or purchase a firearm. In 2010, Mississippi received a score of 10 out of 24 possible points. There were no changes in 2014.

With Mississippi only scoring a maximum of 10 out of 24 points, they are low-to-average compared to other states and their quantitative score for gun control policy.

Table 5: Mississippi Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

		Policy	Crrate
Polic y	Pearson Correlation	1	-.116
	Sig. (2-tailed)		.681
	N	15	15

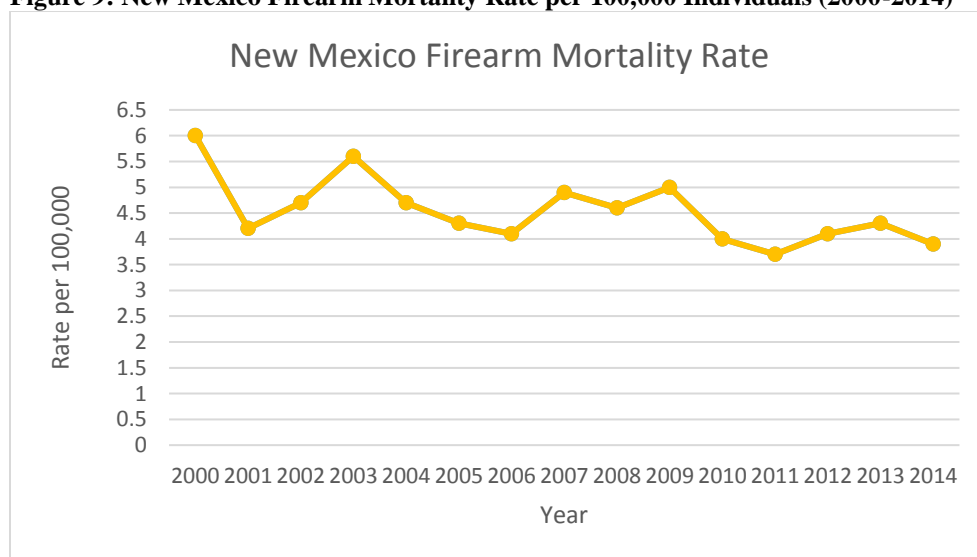


Crrat	Pearson		
e	Correlation	-.116	1
	Sig. (2-tailed)	.681	
	N	15	15

A Pearson correlation test was performed. Mississippi's quantitative gun control policy points variable from years 2000-2014 and Mississippi's mortality rate due to firearms from years 2000-2014 correlated slightly negatively with an R value of  $-.116$ . However, this correlation is not statistically significant because the P value was above  $.05$  with  $P=.681$ .

### New Mexico

**Figure 9: New Mexico Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, New Mexico had a firearm mortality rate of 6 per 100,000 individuals. In 2014, New Mexico had a firearm mortality rate of 3.9 per 100,000 individuals. Overall, New Mexico had a negative trend from years 2000 to 2014, only having a few increases in mortality rate.

**Figure 10: New Mexico Gun Control Policy Quantitative Score (2000-2014)**

In 2000, New Mexico was given a score of 3 points out of 34 possible points. Loaded handgun was not allowed without permission in all places, including safe zones. New Mexico had higher than the federal minimum age standard to purchase or possess a firearm. There was not a law specifying no duty to retreat before using deadly force.

New Mexico did not issue concealed carry permits to residents or nonresidents. New Mexico was not a shall issue or may issue state. There were complete peaceable journey laws in place. There was no state preemption of concealed or open carry ordinances. There was no assault weapons ban, no large capacity ammunition magazines ban, and no 50 caliber rifles ban or regulation. Non powder guns were not regulated. There were no waiting periods in place. There were no restrictions on multiple purchases or sales of firearms. There was no licensing or regulation of gun dealers. There were no gun dealer regulations for mandatory theft reporting of all firearms. There were no store security precautions in place for firearm stores. There were no police inspections of gun stores necessary or permitted. Firearm owners were not required to report thefts. There were no

background checks at private gun shows or sales. There were no state licensing or permitting of gun dealers. There was no safety training in place for licensees/permittees. There was no registration of firearms required. There were no design safety standards. No built in locking devices for firearms were required. There was not an authorized user requirement. There were no ballistic identification requirements, and there was no ammunition microstamping. There was no retention of sales records. The state constitution contains individual right to keep and bear arms. Machine guns, sound silencers, short barreled rifles, short barreled shotguns, and other third class weapons were not prohibited.

In 2006, New Mexico was given 4.5 points out of 34 possible points due to the state requiring and issuing concealed carry permits to residents. New Mexico became a shall issue state. Gun control policy did not change from 2006 to 2014.

New Mexico ranks really low compared to other states because it only received 4.5 points out of 34 possible points.

Table 6: New Mexico Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

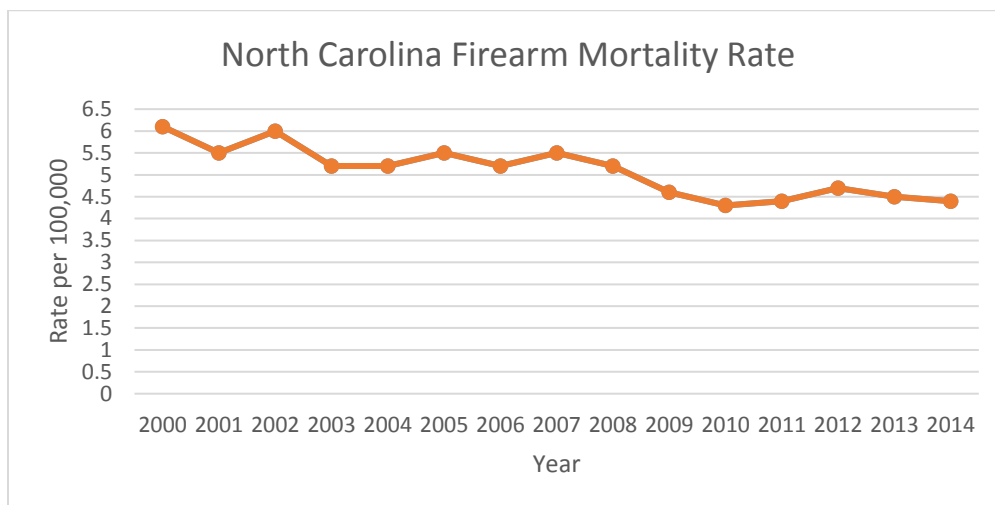
<b>Correlations</b>			
		<b>Policy</b>	<b>Crrate</b>
Policy	Pearson Correlation	1	-.347
	Sig. (2-tailed)		.205
	N	15	15
Crrate	Pearson Correlation	-.347	1
	Sig. (2-tailed)	.205	
	N	15	15

A Pearson correlation test was performed. New Mexico's quantitative gun control policy points variable from years 2000-2014 and New Mexico's mortality rate due to

firearms from years 2000-2014 correlated negatively with an R value of  $-.347$ . However, this correlation is not statistically significant because the due to the P value being above  $.05$  with  $P=.205$ .

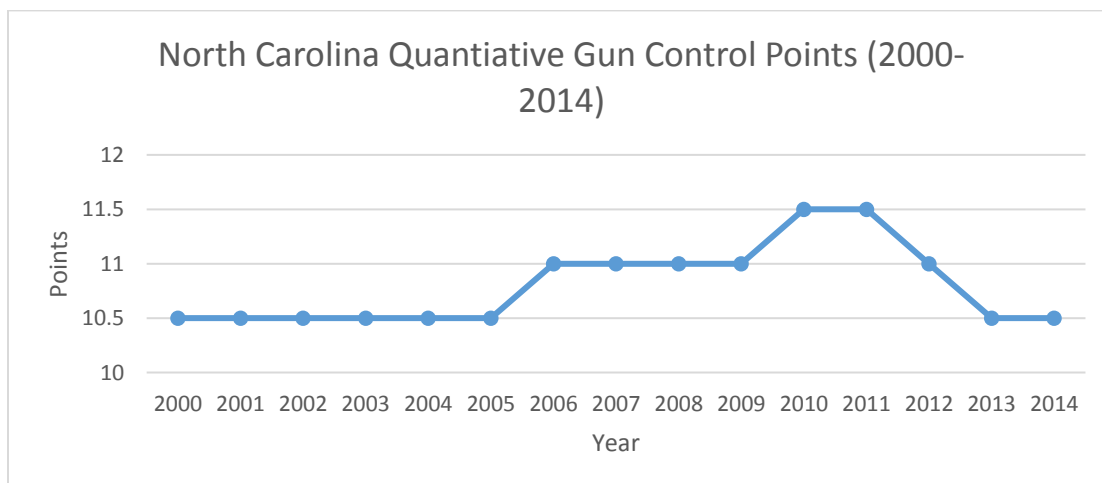
### North Carolina

**Figure 11: North Carolina Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, North Carolina had a firearm mortality rate of 6.1 per 100,000 inhabitants. In 2014, North Carolina had a firearm mortality rate of 4.9 per 100,000 inhabitants. This is a generally negative relationship. As the year increases, the mortality rate generally decreases.

**Figure 12: North Carolina Gun Control Policy Quantitative Score (2000-2014)**



In 2000, North Carolina was given a score of 10.5 possible points out of 34 possible points. North Carolina issued concealed carry permits to both residents and nonresidents. North Carolina was a shall issue state. Loaded handgun carry was not permitted without permission in areas besides safe zones. There was special legislation for some cities for local carry open ordinances and complete state preemption for local concealed carry ordinances. Non powder guns use or possession was regulated. Police inspections of stores were permitted but not required. Background checks are required at private sales and gun shows. Licensing or permitting of gun owners or purchasers occurred on some firearms. Retention of sales records were kept by state. Machine guns, short barreled rifles, short barreled shotguns, and other third class weapons were not prohibited but they are strictly regulated.

In 2000, North Carolina did not have an assault weapons ban. The state also did not have a large capacity ammunition magazines ban, or a 50 caliber rifles ban. There was not a stricter minimum age than the federal standard to purchase or possess a firearm. There was not a waiting period on firearms purchases. There were not any restrictions on multiple purchases of firearms. There was not any licensing or regulation of gun dealers. There were no store security precautions required. Owners were not required to report lost or stolen guns. There was not a safety training in place. Registration of firearms was not necessary. There were no design safety standards for handguns. There were no built in locking devices. There was no authorized user requirement for new handguns. There were no ballistic identification requirements and no ammunition micro stamping required. There was a law specifying no duty to retreat before using deadly force in home. The state constitution contains individual right to keep and bear arms.

In 2006, there was local licensing and regulation of gun dealers. In 2010, all gun dealers were licensed and regulated in North Carolina. In 2012, gun dealers were once again locally regulated. In 2014, silencers were no longer regulated.

Table 7: North Carolina Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

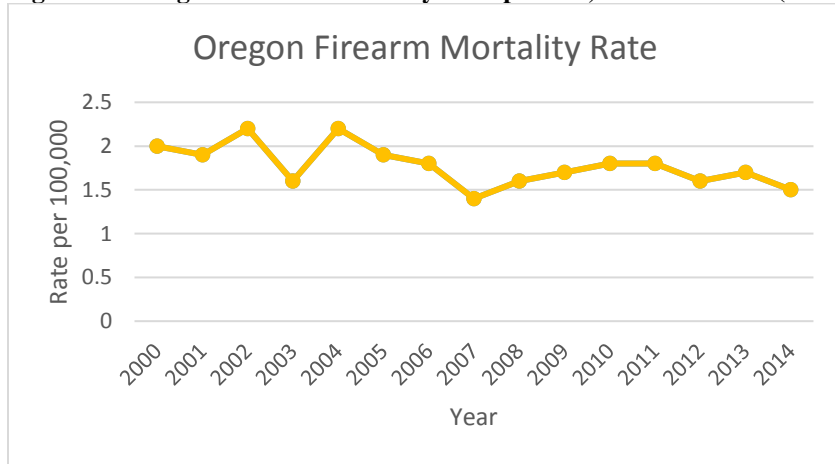
**Correlations**

		Policy	Crrate
Policy	Pearson Correlation	1	-.601*
	Sig. (2-tailed)		.018
	N	15	15
Crrate	Pearson Correlation	-.601*	1
	Sig. (2-tailed)	.018	
	N	15	15

A Pearson correlation test was performed. North Carolina’s quantitative gun control policy points variable from years 2000-2014 and North Carolina’s mortality rate due to firearms from years 2000-2014 correlated negatively with an R value of -.601. This correlation is statistically significant due to the P value being less than .05 at P=.018.

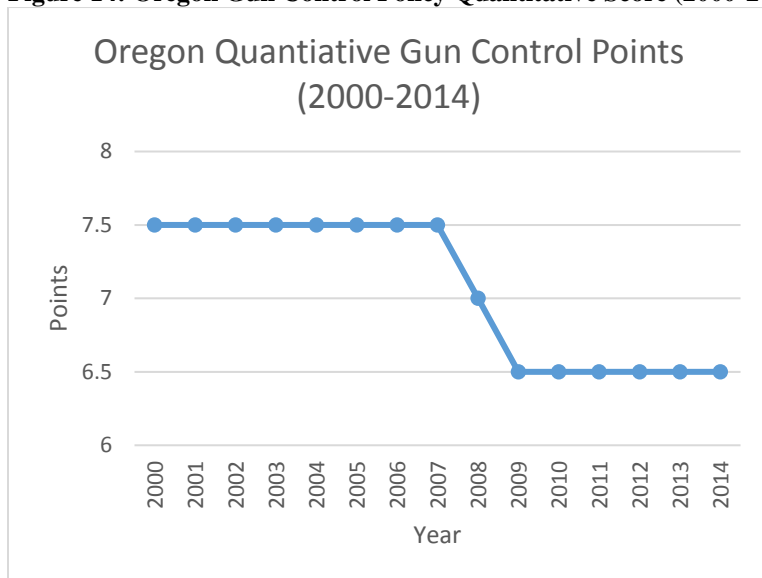
**Oregon**

**Figure 13: Oregon Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, Oregon had a firearm mortality rate of 2.0 per 100,000 individuals. In 2014, Oregon had a firearm mortality rate of 1.5 per 100,000 individuals. There is a general negative trend, with the only increase in firearm mortality rate occurring between years 2001 and 2002 and a valley occurring in 2003.

**Figure 14: Oregon Gun Control Policy Quantitative Score (2000-2014)**



In 2000, Oregon was given a score of 7.5 points out of 34 possible points. Oregon issued concealed carry permits issued to residents and non residents. Oregon was a shall issue state. Carry in motor vehicles is only allowed with a concealed carry permit unless in a locked container. Oregon had state preemption of both local carry ordinances and concealed carry ordinances. Oregon had a stricter minimum age than federal standard. Gun dealers were state licensed and regulated. Police inspections of gun stores were permitted but not required. Retention of firearm sales records were kept by the seller.

Oregon allowed loaded handgun carry without permission in all places besides safe zones. There were no bans on assault weapons, 50 caliber rifles, or large capacity ammunition magazines. Non powder gun use was not regulated. There was not a waiting period on firearms purchases. There were no restrictions on multiple purchases or sales of

firearms. Gun dealers do not have mandatory theft reporting laws. Store security precautions were not required. Owners were not mandated to report lost or stolen guns. Background checks were not required at private sales or gun shows. There was not licensing or permitting required for gun owners or purchasers. There was no safety training in place for licensees or permittees. There was no registration of firearms required. There were no design safety standards. There were no built in locking devices required. There was not an authorized user requirement for new handguns. There was no ballistic identification and no ammunition micro stamping required. There was a specific law specifying no duty to retreat before using deadly force but only in home. Oregon's constitution has the right to keep and bear arms. Machine guns, sound silencers, short barreled rifles, short barreled shotguns, and other third class weapons are not prohibited or regulated.

These laws did not change until 2008 when there was no longer state preemption of for local open carry ordinances. In 2010, the laws changed again when one could now have firearms in plain view in vehicle with a permit.

Table 8: Oregon Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

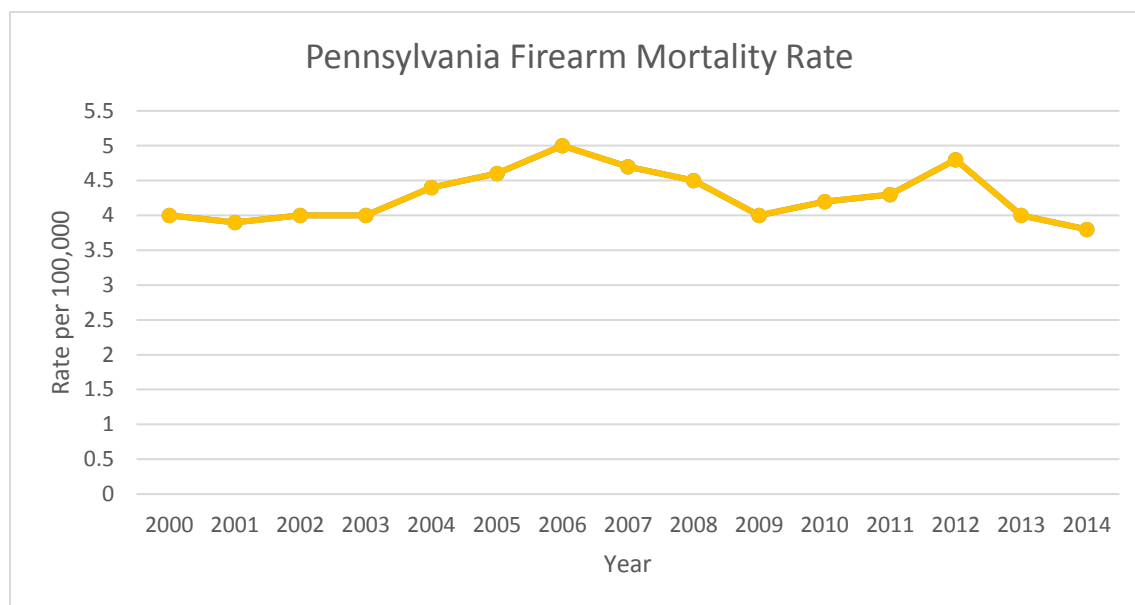
		Policy	Crrate
Policy	Pearson Correlation	1	-.213
	Sig. (2-tailed)		.446
	N	15	15
Crrate	Pearson Correlation	-.213	1
	Sig. (2-tailed)	.446	
	N	15	15



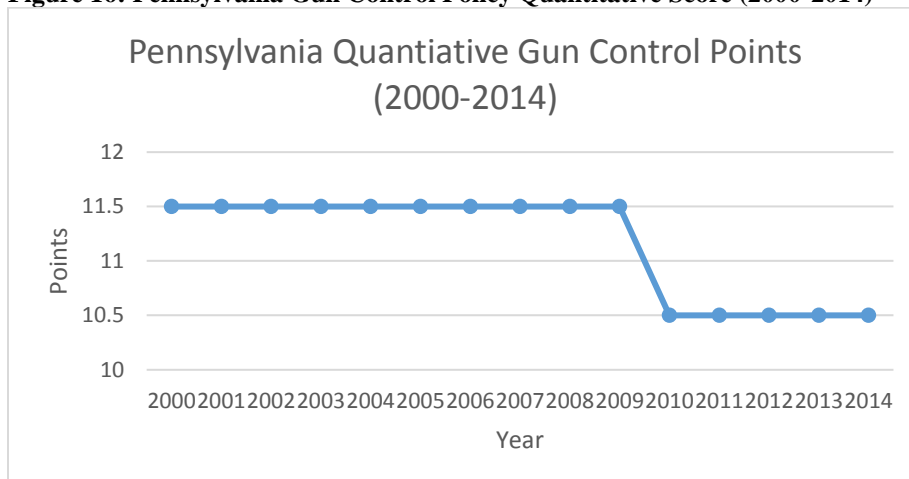
A Pearson correlation test was performed. Oregon's quantitative gun control policy points variable from years 2000-2014 and Oregon's mortality rate due to firearms from years 2000-2014 correlated negatively with an R value of  $-.213$ . This correlation is not statistically significant due to the P value being more than  $.05$  at  $P=.446$ .

### Pennsylvania

**Figure 15: Pennsylvania Firearm Mortality Rate per 100,000 Individuals (1999-2014)**



In the year 2000, Pennsylvania had a firearm mortality rate of 4.0 per 100,000 individuals. In the year 2014, Pennsylvania had a firearm mortality rate of 3.8 per 100,000 individuals. There was a positive trend between years 2003 and 2006 and a negative trend between 2006 and 2009. There was another positive trend between years 2009 and 2012.

**Figure 16: Pennsylvania Gun Control Policy Quantitative Score (2000-2014)**

In 2000, Pennsylvania was given a score of 11.5 points out of 34 possible points for its gun control policies. Pennsylvania issued concealed carry permits to residents and non residents. It was a shall issue state. Loaded gun carry was not allowed in all places besides safety zones without permission. A firearm was allowed in vehicle only if the driver had a concealed carry permit or it was in the glove box. Non-powder guns' use or possession was regulated. Pennsylvania had a stricter minimum age to purchase or possess firearms than the federal standard. Pennsylvania had state licensure and regulation of gun dealers in place. Store security precautions were required. Built in locking devices were required. There were no castle doctrine laws. Retention of sales were kept by the state.

There is not state preemption for concealed carry or open carry ordinances due to Philadelphia having special legislation. Assault weapons, large capacity ammunition magazines, and 50 caliber rifles were not banned or regulated. There was not a waiting period on firearms in order to purchase them. There were not restrictions on multiple purchases or sales of firearms. There was not mandatory theft reporting for gun stores. Police inspections of gun stores were not required. Owners were not required to report

lost or stolen guns. Background checks were not required at private sales and gun shows. There was no licensing or permitting of gun owners. There was no safety training in place for licensees/permittees. Registration of firearms was not necessary. There were no design safety standards for firearms. There was not an authorized user requirement for handguns. There were no ballistic identification requirements in place. No ammunition micro stamping was required. The Pennsylvania state constitution included the right to bear arms. Machine guns, sound silences, short barreled rifles/shotguns, and other class three weapons were not prohibited by state law.

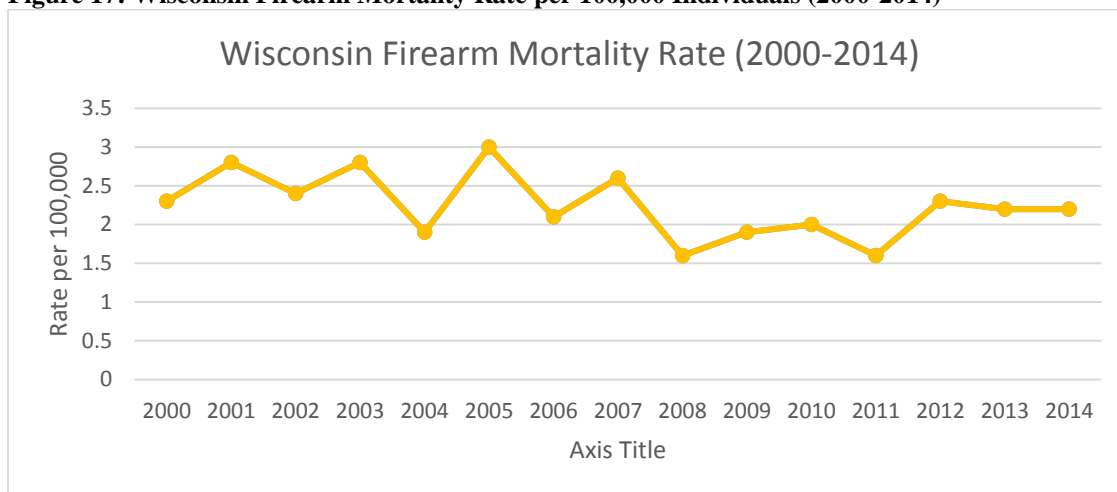
Table 9: Pennsylvania Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

		CrimeType	Policy
CrimeType	Pearson Correlation	1	.119
	Sig. (2-tailed)		.673
	N	15	15
Policy	Pearson Correlation	.119	1
	Sig. (2-tailed)	.673	
	N	15	15

A Pearson correlation test was performed. Pennsylvania's quantitative gun control policy points variable from years 2000-2014 and Pennsylvania's mortality rate due to firearms from years 2000-2014 correlated positively with an R value of .119. This correlation is not statistically significant due to the P value being more than .05 at  $P=.673$ .

## Wisconsin

**Figure 17: Wisconsin Firearm Mortality Rate per 100,000 Individuals (2000-2014)**



In 2000, Wisconsin had a firearm mortality rate of 2.3 per 100,000 individuals. In 2014, Wisconsin had a firearm mortality rate of 2.2 per 100,000 individuals. There are no general trends occurring within the years.

**Figure 18: Wisconsin Gun Control Policy Quantitative Score (2000-2014)**



In 2000, Wisconsin was given a score of 7.5 points out of 34 possible points. Loaded handgun carry was not allowed in all places besides safe zones with permission. Guns were not allowed in vehicles unless the gun is in a locked container. There was state preemption of local open/concealed carry ordinances. Non powder guns use and possession was regulated. There was a stricter minimum age to purchase or possess

firearms than the federal standard. There was a waiting period on some firearm purchases. State licensure was present. There were no castle doctrine laws.

Concealed carry permits were not required and they were not issued to residents or non residents. There was no legislation for shall issue or may issue laws. Assault weapons, large capacity ammunition magazines, and 50 caliber rifles were not regulated. There were not restrictions on multiple purchases of firearms. There were no mandatory theft reporting laws. There were no store security precautions. There were no state mandated police inspections of gun stores. Owners were not required to report lost or stolen guns. Background checks were not required at private sales or gun shows. There was not licensing or permitting of gun owners or purchasers. There was no safety training for licensees/permittees. No registration of firearms was required by the state. There were no design safety standards for handguns. There were no built in locking devices required. There were no authorized user requirements for new handguns required. There were no ballistic identification requirements. There was no ammunition microstamping required. Retention of sales records are not kept. In Wisconsin's constitution, there is an amendment for the individual right to keep and bear arms. Machine guns, sound suppressors, short barreled rifles and shotguns, and other third class weapons are not prohibited.

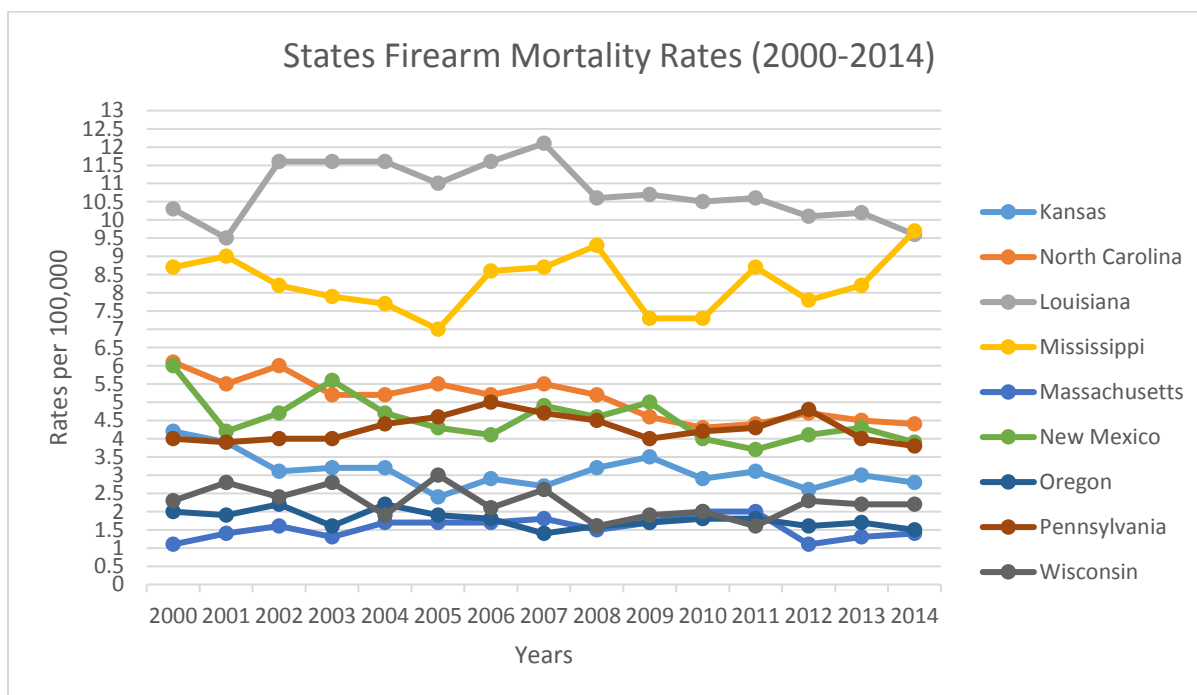
In 2008, Wisconsin became a shall issue state. In 2011, contradictory legislature was passed. Concealed carry permits were now issued to residents, however, loaded handgun carry was now allowed without permission. Retention of sales records were now kept by firearm sellers, but castle doctrine that applied to the home only was also passed.

Table 9: Wisconsin Firearm Mortality Rate per 100,000 Individuals in Correlation with Quantitative Measures of Gun Control Policy

		CrmRate	Policy
CrmRate	Pearson Correlation	1	-.631*
	Sig. (2-tailed)		.012
	N	15	15
Policy	Pearson Correlation	-.631*	1
	Sig. (2-tailed)	.012	
	N	15	15

A Pearson correlation test was performed. Wisconsin's quantitative gun control policy points variable from years 2000-2014 and Wisconsin's mortality rate due to firearms from years 2000-2014 correlated negatively with an R value of -.631. This correlation is statistically significant due to the P value being less than .05 at  $P=.012$ .

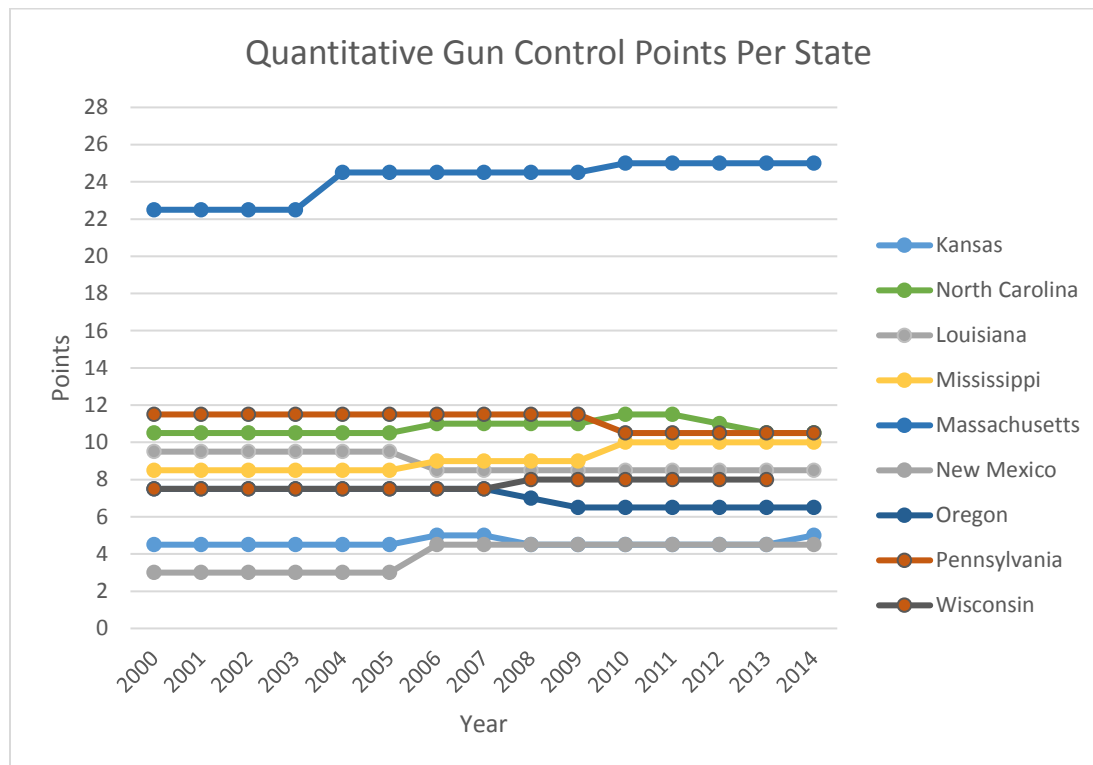
Figure 19: State Comparison Firearm Mortality Rate (2000-2014)



Louisiana and Mississippi both had the highest firearm mortality rates compared to other states. Massachusetts had the lowest firearm mortality rates overall with Oregon as

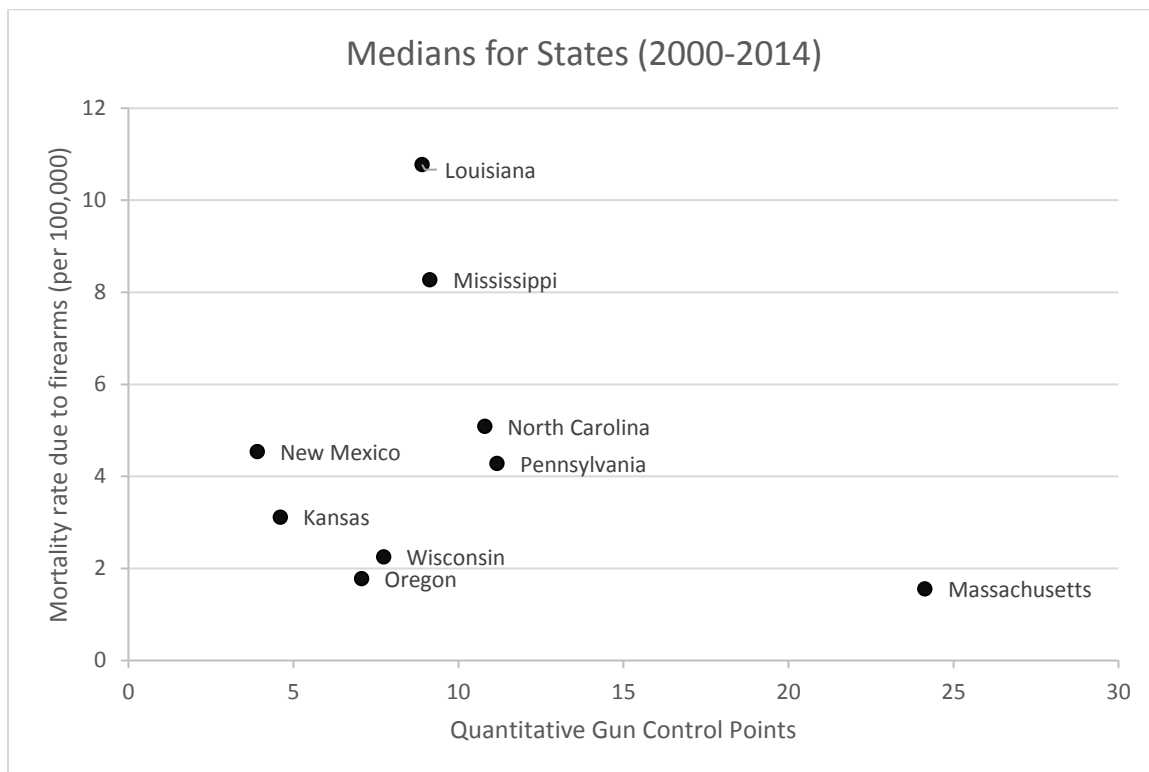
a close second for lowest firearm mortality rates. When combining the states, no general trends are noticed.

**Figure 20: State Comparison Quantitative Gun Control Points (2000-2014)**



Massachusetts had the highest gun control points overall. Pennsylvania had the second highest gun control points, with a high of 12 points. New Mexico had the lowest amount of gun control points with a high of 4 points. Kansas had the second lowest amount of gun control points with a high of 5 points.

**Figure 21: State Gun Control Medians compared to State Firearm Mortality Medians for 2000-2014**



This graph shows general relationships between the two variables for each state.

Massachusetts had both the highest gun control points media, 24.1333, and the lowest mortality rate median, 1.5533, for years 2000-2014. Louisiana had the highest mortality rate median, 10.7733, and was about average, in terms of this study, for its gun control points median which was 8.9 points. A slight negative trend is noticeable, however, there are a lot of outliers.

## Discussion

The hypothesis for this study was that stricter gun control laws would be associated with lower firearm mortality rates. Massachusetts showed evidence for this hypothesis as it had the highest gun control quantitative points and the lowest mortality rate. However, Massachusetts' mortality rate and mortality rate's correlation were not statistically significant. Both North Carolina's and Wisconsin's variables had statistically significant



relationships. These relationships were both strongly negative. Thus, as their state gun control legislation strengthens, the firearm mortality rate decreases. 3 out of the 9 states showed evidence for the hypothesis and the other 6 states (Kansas, Louisiana, New Mexico, Mississippi, Pennsylvania and Oregon) did not support nor negate the hypothesis. However, it is important to note that in 6 out the 9 states, there was a negative correlation, however, only the North Carolina and Wisconsin Pearson Correlation tests were deemed to be statistically significant.

Due to Massachusetts, North Carolina, and Wisconsin showing support for my hypothesis, the other factors that typically influence crime were also studied in comparison to the national average. This was done to see if these factors, if incredibly lower than the national average, could have had possible confounding variables.

Table 10: Demographic Factors that Influence both Mortality and Crime Rate

People	WI	MA	NC	US
<i>Age and Sex</i>				
Persons under 5 years, percent, April 1, 2010	6.3	5.6	6.6	6.5
Persons under 18 years, percent, April 1, 2010	23.6	21.7	23.9	24.0
Persons 65 years and over, percent, April 1, 2010	13.7	13.8	12.9	13.0
Female persons, percent, April 1, 2010	50.4	51.6	51.3	50.8
<i>Race and Hispanic Origin</i>				
White alone, percent, April 1, 2010 (a)	86.2	80.4	68.5	72.4
Black or African American alone, percent, April 1, 2010 (a)	6.3	6.6	21.5	12.6
Two or More Races, percent, April 1, 2010	1.8	2.6	2.2	2.9
Hispanic or Latino, percent, April 1, 2010 (b)	5.9	9.6	8.4	16.3
White alone, not Hispanic or Latino, percent, April 1, 2010	83.3	76.1	65.3	63.7
<i>Education</i>				
Bachelor's degree or higher, 25&+, 2000-2014	27.4	40.0	27.8	29.3
<i>Income and Poverty</i>				
Median household income (in 2014 dollars), 2010-2014	52,738	67,846	46,693	53,482
Per capita income in past 12 months (in 2014 dollars), 2010-2014	27,907	36,441	25,608	28,555
Persons in poverty, percent	12.1	11.5	16.4	13.5

Source: United States Census Bureau, census.gov

This table shows key factors that influence crime and violence in comparison to the United State's average. Massachusetts had multiple confounding variables that could have attributed to the low crime rate, other than the strict gun control legislation. Massachusetts had below average on the amount of young people in its population. It also had a significantly higher amount of people who had bachelor's degrees, 40% of the population compared to 29% of the United States Population. Massachusetts also had a higher than average median household income, a higher than average per capita income, and a lower than average poverty rate. All of these factors would contribute to a low mortality rate and thus the strict gun control legislation is not the only factor at hand that correlates with the low mortality rate.

North Carolina is on the opposite side of the spectrum. North Carolina has a lower than average median household income and per capita income. The state has a higher than average poverty rate. These factors would contribute to a high mortality rate and would thus strengthen the statistically significant correlation found between increasing the gun control legislation and the decreasing mortality rate.

Wisconsin's confounding variable factors were all close to the United States average and thus these confounding variables do not strengthen nor weaken the correlation.

This hypothesis, along with findings, are supported by the literature. Most studies have shown that stricter state gun control laws such as the correct implementation of background checks, state licensure of firearm dealers, and not enacting castle doctrine, have a statistically significant negative impact on the homicide rate using firearms as a whole. Only one study was found that also compared state by state gun legislation strength in comparison to homicides and suicides using firearms. This study, completed

in 2013, also found that higher legislative strength scores were associated with lower rates of firearm fatalities overall (Fleegler et al, 2013).

The results of this study show that stronger gun control legislation is correlated with higher firearm mortality rates. One has to question why states have not yet passed firearm legislation that strengthens their gun control policies. A suggestion for states is to pass stronger gun control legislation in order to limit the amount of people who die everyday as a result of gun violence, and to limit the costs that face the state and our nation due to gun violence.

However, it is important to note that other factors could have contributed the correlations that were found in this study. Many other factors influence mortality rates and crime rates alike. These factors include but are not limited to demographics, poverty levels, gang presence, college education, and the unemployment rate. Also, the political leanings of the state can strongly influence the state's legislation passed on gun control.

A weakness of this study is that it did not set control variables of these other factors, even though they were examined. The amount of time and the process that is necessary to set control variables is too time consuming for a project of this magnitude. Magdalena Cerda studied collected multiple studies for publishing in the American Journal of Epidemiology and found that a major flaw of most firearm legislation studies was that the correlations could be attributed to other confounding variables (2016). However, this project is not stating that firearm legislation is a cause of firearm mortalities which is the effect. This study simply shows that there is a statistically significant correlation in some states between stronger gun control legislation and the firearm mortality rate.

This study is unique in that it is longitudinal. The only study that was found that has examined gun control laws on a quantitative basis and compared gun control laws to firearm mortalities was completed by Fleege et al. in 2013. This study only used data from 2007-2010 but did focus on all fifty states.

For further research, the causes of firearm violence need to be further studied as well as what populations specifically are associated with firearm violence. Also, there needs to be more prevention research. Legislation could be a possible way to prevent firearm mortalities but it is not the only option. Also, there are states that might never pass strict gun control legislation unless it is passed on a federal level and thus other prevention strategies definitely need to be researched.

The topic of gun control is not a new one. The lack of government funding and attention has not allowed large scale research topics to be done on the issue. The lack of a movement and organizations supporting gun control until recent years has also caused the United States to not pass new federal legislation and for many states to also maintain weak gun control policies. The research that has been done on the topic of stronger gun control laws has mostly shown a reduction in the number of gun violence associated deaths. The states that have changed their policies in 2000-2014 have mostly experienced negative correlations between the stronger gun control legislation and the firearm associated mortality rates, which was hypothesized due to the previous literature. Only 3 out of the 9 states were deemed to truly support this hypothesis due to statistical significance, however, 6 out of the 9 states had a negative correlation between the two variables. Confounding variables to the low mortality only truly affected one state that was deemed significant and the other states were not deemed affected by the confounding

variables studied. Overall, state by state gun control legislation should be pushed to the forefront of political agendas in order to save lives, money, and increase the safety in this country.

## References

29 Hamline L. Rev. 637 (2006) (Westlaw, Dist. file).

Alzheimer, I. (2008). Do guns matter? A multi-level cross-national examination of gun availability on assault and robbery victimization. *Western Criminology Review*, 9(2), 9-32. Retrieved November 07, 2016.

Bulzacchelli, M. T., Mair, J. S., Webster, D. W., Vernick, J. S., (2006). Regulation of firearm dealers in the united states: an analysis of state law and opportunities for improvement. *Journal of Law, Medicine and Ethics*, 34, 765-786.

Brady Handgun Control Act, H.R.1025.ENR, Received from The Library of Congress  
Website: <http://thomas.loc.gov/cgi-bin/query/z?c103:H.R.1025.ENR:>.

Centers for Disease Control and Prevention. (2014). Firearm mortality by state: 2014.  
Retrieved from:<http://www.cdc.gov/nchs/pressroom/sosmap/firearm.htm>.

Cerda, M., Dr. (2016, February 09). Editorial: gun violence- risk, consequences, and prevention. *American Journal of Epidemiology*, 183(6), 516-517. Retrieved November 09, 2016, from Google Scholar.

- Cheng C, Hoekstra M. Does strengthening self-defense law deter crime or escalate violence? Evidence from expansions to castle doctrine. *J Hum Resour.* 2013;48(3):821–854.
- Federal Bureau of Investigation. (2014). *National instant criminal background check system (nics) operations*. Retrieved from <https://www.fbi.gov/about-us/cjis/nics/reports/2014-operations-report>.
- Fleegler, E. W., Lee, L. K., Monuteaux, M. C., Hemenway, D., & Mannix, R. (2013, May 13). Firearm legislation and firearm-related fatalities in the united states. *JAMA Internal Medicine, 173*(9), 732-740.  
doi:10.1001/jamainternmed.2013.1286
- Gius, M. (2013, November 26). An examination of the effects of concealed weapons laws and assault weapons bans on state-level murder rates. *Applied Economics Letters, 21*(4), 265-267. doi:10.1080/13504851.2013.854294
- Goss, K. A. (2003). CHAPTER ONE. The gun control (participation) paradox. *Disarmed The Missing Movement for Gun Control in America*, 1-30.  
doi:10.1515/9781400837755.1

- Irvin, N., Rhodes, K., Cheney, R., & Wiebe, D. (2014). Evaluating the effect of state regulation of federally licensed firearm dealers on firearm homicide. *American Journal of Public Health, 104*(8), 1384-1386. doi:10.2105/ajph.2014.301999
- Koper, C., & Roth, J. A. (2001, March). The impact of the 1994 federal assault weapon ban on gun violence outcomes: an assessment of multiple outcome measures and some lessons for policy evaluation. *Journal of Quantitative Criminology, 17*(1), 33-74. doi:10.1023/A:1007522431219
- Kovandzic, T. V., & Marvell, T. B. (2003, July). Right-to-carry concealed handguns and violent crime: crime control through gun decontrol? *SSRN Electronic Journal SSRN Journal, 2*(3), 363-396. doi:10.2139/ssrn.321820
- Kovandzic, T. V., Marvell, T. B., & Vieraitis, L. M. (2005, November). The impact of "shall-issue" concealed handgun laws on violent crime rates. *Sage Publications, 9*(4), 292-323. Retrieved November 07, 2016.
- Lemieux, F. (2014, June). Effect of gun culture and firearm laws on gun violence and mass shootings in the united states: a multi-level quantitative analysis. *International Journal of Criminal Justice Sciences, 9*(1), 74-93. Retrieved November 07, 2016.



Lott JR, Mustard DB. Crime, deterrence, and right-to-carry concealed handguns. *J Legal Stud.* 1997;26(1):1–68.

Lott J. *More guns, less crime: understanding crime and gun control laws.* 3rd ed. Chicago, IL: University of Chicago Press; 2010.

Mays, L. G., Ruddell, R., (2005). State background checks and firearms homicides. *Elsevier Journal of Criminal Justice*, 33, 127-136.  
doi:10.1016/j.jcrimjus.2004.12.004

Panjamapirom, A., Sen, B., (2012). State background checks for gun purchase and firearm deaths: An exploratory study. *Elsevier Preventive Medicine*, 55(4), 346-350. doi:10.1016/j.ypmed.2012.07.019

Regions and Divisions - U.S. Census Bureau. Retrieved November 09, 2016, from [http://www.census.gov/econ/census/help/geography/regions\\_and\\_divisions.html](http://www.census.gov/econ/census/help/geography/regions_and_divisions.html)

Santaella-Tenorio, J., Cerdá, M., Villaveces, A., & Galea, S. (2016, September 4). What do we know about the association between firearm legislation and firearm-related injuries? *Epidemiologic Reviews Epidemiol Rev*, 38, 140-157.  
doi:10.1093/epirev/mxv012

- Sen, B., & Panjamapirom, A. (2012, October). State background checks for gun purchase and firearm deaths: An exploratory study. *Preventive Medicine*, 55(4), 346-350. doi:10.1016/j.ypmed.2012.07.019
- Sorens, Jason, Fait Muedini, and William P. Ruger (2008). "U.S. state and local public policies in 2006: a new database." *State Politics and Policy Quarterly* 8 (3): 309-26.
- Sumner, S. A., Layde, P. M., & Guse, C. E. (2008, December). Firearm death rates and association with level of firearm purchase background check. *American Journal of Preventive Medicine*, 35(1), 1-6. doi:10.1016/j.amepre.2008.03.023
- U.S. mass shootings in 2016. (n.d.). Retrieved November 09, 2016, from <http://massshootingtracker.org/>
- United States, United States Census Bureau. (n.d.). *Quick Facts*. Retrieved November 10, 2016, from <https://www.census.gov/quickfacts/table/AGE135215/37,00>
- Wing, N. (2015, December 14). Here's a list of all the gun control laws congress has passed since newtown. *Huffington Post*.

Wintemute, G. J. (2007). Gun shows across a multistate American gun market:  
Observational evidence of the effects of regulatory policies. *Injury Prevention*,  
13(3), 150-155. doi:10.1136/ip.2007.016212

Zimring, F. A., (2004). Firearms, violence, and the potential impact of gun control.  
*Journal of Law, Medicine and Ethics*, 32, 34-41.