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## Concealed Weapon Proliferation and the Impact on Firearm-Related Fatalities and Injuries Due to Assault in Kentucky, 2005-2013

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CONCEALED WEAPON PROLIFERATION AND THE IMPACT ON FIREARM-  
RELATED FATALITIES AND INJURIES DUE TO ASSAULT IN KENTUCKY,  
2005-2013

CAPSTONE PROJECT PAPER

A paper submitted in partial fulfillment of the  
requirements for the degree of  
Master of Public Health  
in the  
University of Kentucky College of Public Health  
By  
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Lexington, Kentucky

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## Abstract

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### Objectives:

The objective of our research was to look broadly at firearms and health in the state of Kentucky, where annual gun purchases are rising and laws eliminating restrictions on concealed carry have empowered more than 300,000 citizens to carry firearms in virtually any public setting. As guns become more prevalent, and more readily accessible, will violent crime decrease as some have predicted, or will the potential for conflict escalation cause the opposite effect?

### Methods:

Utilizing death records for firearm-related homicides and hospitalization and emergency department visit data for injuries occurring due to firearm-related assault, we correlated the rate of concealed carry permit holding in Kentucky with the rate of incident of firearm-related injuries and deaths between 2005 & 2013. We also examined trends for firearm-related homicides and assaults between the years 2000-2013 to see if firearm-related violent crimes have increased as a proportion of the total incidents and if violent crime in Kentucky has moved in accordance with the national downward trend.

### Results:

No significant association was found between CCDW rates and firearm-related homicide rate, firearm-related hospitalization due to assault rates or firearm-related ED Visit rates in Kentucky between 2005 & 2013 when controlling for population growth, although the low power of the study virtually precludes significant outcomes. Upward trends were observed for all variables. Firearm-related hospitalizations due to assault were found to be increasing significantly as a proportion of the total number of hospitalizations due to assault between 2000-2013.

### Conclusions:

Contrary to the "More Guns, Less Crime" argument of the late 90s that spurred a nationwide movement towards right to carry legislation, our findings support the conclusion that concealed carry permission does not reduce violent crime. A significant upward trend was discovered for hospitalizations due to firearm-related assault as a proportion of the total number of such hospitalizations. This might suggest that firearm injuries are more often serious enough to require inpatient treatment. It might also suggest that firearms are displacing other mechanisms of assault (e.g. striking, cutting, etc.) among those admitted to the hospital. While no statistically meaningful association was found between CCDW and hospitalizations due to assault, the p-value was sufficiently "marginal" that a more refined analysis could alter the result.

## *Introduction*

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Firearm-related violence has long been a public health problem in the United States. The CDC reported 11,208 firearm homicides in 2013, at a rate of 3.5 deaths per 100,000 population.<sup>1</sup> Studies have shown US firearm homicide rates to be nearly 20 times those of other high-income nations.<sup>2</sup> These numbers are small, though, when compared to the large volume of non-fatal firearm-related injuries, 43 of which are estimated to occur for every fatality.<sup>3</sup> The majority of these injuries are the result of firearm assault, the annual medical cost of which has been estimated at \$439 million.<sup>4</sup>

It has become a familiar cycle. High profile mass shootings at schools, universities and other public forums spur politicians and pundits to renew efforts for greater gun control legislation, which drives up firearm sales from citizens fearing regulation.<sup>5</sup> In August of 2015, following a string of shootings in Charleston, SC, Lafayette, LA and Roanoke, VA, the FBI posted 1.7 million background checks, the highest posted for any August since checks began in 1998.<sup>5</sup> This spike is not an aberration but a developing trend, the most notorious of which occurred in the wake of the tragedy at Sandy Hook in Newtown, CT in 2012.<sup>6</sup>

In Kentucky, the annual numbers for background checks are striking. Launched by the FBI in 1998, the National Instant Criminal Background Check (NICS) keeps data for the federally-mandated background checks conducted by federal firearm licensees to determine the eligibility of prospective buyers prior to sale.<sup>7</sup>

The NCIS is an imperfect proxy for gun sale numbers, as multiple guns purchased simultaneously would only result in one background check, but it gives us a rough idea of how purchasing trends have shifted. (Figure 1). After holding steady at an average of 232,000 from 2000-2005, background check totals have risen to an all-time high 2.4million in 2014.<sup>7</sup>

Gun sales are increasing, but guns are also more readily available as laws reducing restrictions on carrying concealed firearms are being enacted in every state. Illinois, the last state to maintain a ban on carrying weapons in public, was required, under a decision by the U.S. Seventh Circuit Court of Appeals in December 2012, to rescind the ban and enact a new law granting concealed carry privilege to its citizens.<sup>8</sup> The image below, provided by the Law Center to Prevent Gun Violence shows how thoroughly the legal landscape has shifted in the U.S. over the past 30 years.<sup>9</sup> Every state now allows concealed carry. It is only a matter of whether the law perceives it as a right or a privilege.

Kentucky's license to carry concealed deadly weapons (CCDW) law became effective on October 1, 1996 following the passage of House Bill 40.<sup>10</sup> The statute was established as a "shall issue" law, under which the issuing authority is *required* to grant permits to every applicant without exception unless a select and pre-defined disqualifying condition is met (e.g., prior felon).<sup>10,11</sup> The majority of states have adopted similar "shall issue" laws, while most of the remaining enacted "may issue" laws in which the issuing agency has discretion to grant or deny permits.<sup>9,11</sup> Four states require no permit at all.

Over the past decade, more than a dozen measures have been passed to amend the original Kentucky statute, the combined effect of which has been to greatly reduce restrictions on concealed-carry holders and to simplify and expedite the application process.<sup>12</sup> See Figure 3 for a partial list of recent amendments.

Notably, for the purposes of this study, public access to permit holder information has been eliminated, making it impossible to consider broader demographic trends (age, race, ethnicity, etc.) or to identify the number and nature of violent crime cases that specifically involve carriers of concealed deadly weapons. The Kentucky State Police is only allowed to report the total number of applications, the number approved, and the number revoked or suspended. Even the police department's access to CCDW holder information has been limited by law.

As restrictions have eased, the number of CCWD permits issued annually, and thus the total number of CCWD permit holders across the state have increased dramatically. The number of CCDW permit holders has more than tripled over the past decade from roughly 105,000 in 2005 to over 320,000 in 2014.<sup>13</sup> By the end of 2014, one in every twelve Kentuckians of legal age had sought and attained permission to carry firearms concealed on their person in virtually any public setting. (Figures 4 & 5)

Much has been written of the dramatic decline in violent crime in the United States over the past two decades and much research and speculation has followed in an attempt to explain it. According to the Federal Bureau of



Investigation, violent crime rates, including homicide and aggravated assault, have dropped by nearly 50% since 1993, and by nearly 19% since 2005.<sup>14</sup> Studies have pointed to a number of wildly disparate causal factors, ranging from the mass incarcerations of the drug war<sup>15</sup> to the phasing out of lead under the Clean Air Act.<sup>16</sup> Some political advocacy groups have pointed to the sweeping nationwide adoption of concealed carry laws as an explanation for the decline, positing that the potential presence of concealed firearms serves as a deterrent to would-be assailants.<sup>17</sup>

In this study, we look at violent crime in one state, Kentucky, where gun laws rank amongst the least restrictive in the nation. We investigated trends in homicide and assault numbers over the past decade, shifts in firearm-specific injury numbers in the context of increases in concealed carry permit holders, and potential associations between the total number of CCDW permit holders and the number of firearm-related deaths and injuries.

We hypothesized that, contrary to the arguments that have informed our state's public policy, the increasing prevalence of concealed deadly weapons has not served as a deterrent to violent crime. Furthermore, we anticipated that the dramatic rise in concealed carry permits would lead to more firearm-related fatalities and injuries as public confrontations gain the immediate potential to escalate into more dangerous life-threatening showdowns.

## *Literature Review*

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It should be noted that literature on concealed carry laws and the impact on violent crime is relatively small, greatly hampered by a congressional ban on CDC gun research that coincided precisely with the peak era of CCDW law implementation.<sup>18</sup> Much of what research does exist has been conducted by politically-funded special interest groups and published online without academic peer review.

A 1997 study by Lott & Mustard initiated the "More Guns, Less Crime" line of research that informed a nation-wide policy push towards shall-issue concealed carry laws. The study utilized county-level crime data to conclude that concealed carry laws serve to deter violent crime while producing no increase in unintentional deaths.<sup>19</sup> Comparing crime data prior to implementation with crime data after implementation, Lott & Mustard reported that murder rates dropped by 8.5 percent and aggravated assaults by 7 percent in counties where "shall-issue" laws went into effect.<sup>19</sup>

In the years that followed a number of studies expanded on, corroborated or disputed Lott & Mustard's findings, all of which employed similar methodology, conducting new statistical analyses using Lott's original data, modified versions of Lott's data or similar datasets that expanded the time period of the original study.<sup>20,21,22,23</sup> However, in 2005, a comprehensive review of the Lott/Mustard model conducted by the National Research Council definitively ended the debate. The NRC panel concluded, with only one of the sixteen panel members

dissenting, that the data provided no reliable statistical support for the Lott/Mustard conclusion.<sup>20,24</sup> The panel found that 1) the model is highly sensitive to small variations in data and specification, 2) estimates are not statistically significant without including select demographic and socioeconomic covariates and 3) estimates do not hold up when extended 8 years to include a period in which a large number of states adopted the laws.<sup>24</sup>

With regard to homicide, recent literature supports the NRC findings, showing the relationship between homicide and CCDW to be equivocal at best. Some reveal small positive correlations<sup>25</sup> while others find no demonstrable link whatsoever.<sup>20,26</sup> A recent study published in JAMA, however, reported an association between a higher number of firearm *restrictions* and a lower rate of firearm fatality.<sup>27</sup>

The evidence connecting concealed carry to aggravated assault is far more one-sided. A recent study at Stanford University extends the Lott & Mustard framework of a decade to include 1999 - 2010, shifting from less reliable county-level data to more rigorously compiled state-level data. Highly critical of the 36 demographic control variables utilized in the Lott/Mustard model, the Stanford group controlled only for the demographic groups most associated with criminality, namely the percentage of white and black males between the ages of 10 and 40.<sup>20</sup> Their estimates found that CCDW laws increase cases of aggravated assault by 8 percent.<sup>20</sup> Other studies have found similar associations

between gun ownership or gun possession and firearm-related aggravated assault.<sup>28</sup>

The complement to the "More Guns, Less Crime" argument is that carrying guns empowers self-defense against gun-toting would-be criminals. A recent study by the Violence Policy Center examined the national numbers related to "justifiable homicides" and found that only 259 of the 8,342 gun homicides committed in the U.S. in 2012 were related to self-defense. In other words, for every 32 gun-related homicide there was only 1 committed in justifiable self-defense.<sup>29</sup> The study went on to consider cases of self-defense where the criminal was not killed, a number the NRA and other gun advocacy groups claim to be as many as 2.5 million instances per year.<sup>29,30,31</sup> The Bureau of Justice Statistics' National Crime Victimization Survey found that in the five year period between 2007 and 2011, less than 1% of victims of attempted or completed violent crime reported using firearms in self-defense, or roughly 236,000 out of the nearly 30 million victims.<sup>29</sup> That is 236,000 for the *five-year period*, a time period for which the NRA estimate would claim 12.5 million.

## **Methods**

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### *Data Source and Data Collection Procedures*

Two data sources were used in this study.

For Kentucky homicide statistics, 2005-2014 data from the National Violent Death Reporting System was utilized. NVDRS is an incident-based, violent

death surveillance system that combines data from multiple sources to capture details on violent deaths. Data sources include coroner and medical examiner reports, toxicology reports, various law enforcement records, and death certificates.<sup>32</sup> NVDRS includes information on all homicides, suicides, legal intervention deaths, unintentional firearm deaths, and deaths of undetermined intent in the 18 states in which it is implemented.<sup>32,33,34,35</sup>

For each violent death event, the system captures details on victims, suspected perpetrators and their relationships to the victims, weapons involved, and circumstances leading up to the injury event.<sup>33</sup> All information is linked by incident in NVDRS so that violent events that involve multiple victims can be examined simultaneously.<sup>32</sup>

For injuries or emergency room visits due to assault, and for Homicides in the trend analysis, the study utilized annual injury data from the Kentucky Injury Prevention and Research Center (KIPRC). The primary source for KIPRC injury data was the Kentucky Inpatient Hospitalization and Outpatient Services Claims Files, held at the Cabinet for Health and Family Services, Office of Health Policy. Definitions for injuries in the KIPRC reports correspond to the CDC's "State Injury Indicators Report: Instructions for Preparing 2012 Data." Case selection was limited to discharges of Kentucky residents from nonfederal, acute care, or inpatient facilities. Readmissions, transfers, and deaths occurring in the hospital are included.<sup>36</sup>

An injury subset for hospitalizations was first created by selecting discharges having a principal diagnosis code in the following ranges: 800–909.2, 909.4, 909.9, 910–994.9, 995.5–995.59, 995.80–995.85.<sup>36</sup> The injury subset for emergency department visits was created similarly, but also included visits having a valid external cause of injury code regardless of the principal diagnosis. Emergency department visits involving discharge to an inpatient facility were excluded.<sup>36</sup>

Concealed carry permit data was gathered from Kentucky State Police "Carrying Concealed Deadly Weapons Annual Statistical Reports" which indicates the number of licenses newly issued, revoked, suspended and denied between January 1 and December 31 of each year, as well as cumulative numbers since inception. Beginning with the cumulative numbers for 2004, we added newly issued licenses and subtracted revoked and suspended license for each year through 2013.

Considerable time was spent reviewing homicide and injury numbers compiled by the Kentucky State Police (KSP) and the Federal Bureau of Investigation. This data has informed the majority of the national research conducted on the issue.

A close review showed KSP data to be inconsistent from year to year, with significant outliers and deceptively incomplete county-level data (Figure 6: Firearm-related Homicides by Data Set). Specifically, annual numbers for homicides and assaults, beginning in 2011 when the KSP reporting structure was

revised to match the system employed by the FBI, were reported without the inclusion of data from the Louisville Metro Police and a number of other "summary agencies". In 2011, for example, not only Louisville Metro but Lexington-Fayette County, Highland Heights, Georgetown and Frankfort were categorized as summary agencies and excluded from the officially reported crime statistics. Representatives at the Kentucky State Police confirmed that Louisville Metro Police data has been omitted from reported annual violent crime totals since 2011 due to format incompatibility with the new reporting structure.

The website for the FBI's Uniform Crime Reporting Program lists KSP as its primary source for Kentucky data, reporting strikingly similar homicide numbers for the years 2011-2014. It is therefore reasonable to assume that the same omissions exist in the FBI data and that, consequently, violent crime has been severely under-reported for the state of Kentucky both locally and nationally over the past four years. Louisville alone accounted for 15-20% of annual murders in the state of Kentucky over the time period in question.

Taken further, this begs the question: have similar changes in reporting structure been implemented in other states and, if so, to what degree could the much-trumpeted national drop in violent crime have been exaggerated by inconsistencies in the data?

### *Variables*

Outcome variables included the following:

- Firearm-related homicide rate per 100,000
- Firearm-related hospitalization due to assault rate per 100,000
- ED visit rate per 100,000
- Firearm-related homicides as a proportion of the total number of homicides
- Firearm-related hospitalizations as a proportion of the total number of hospitalizations

The exposure variables were concealed carry rate per 100 persons and calendar year. The former is intended to correlate concealed carry rate with the above listed outcome variables, while the latter was utilized to examine statewide violent crime trends over the past decade.

By employing rates, state population growth was controlled for in the analysis.

### *Statistical Analysis*

Simple linear regression analysis was conducted to determine if the incidence of firearm-related deaths and medical encounters (firearm-related homicide, firearm-related injury due to assault and firearm-related ED visit due to assault) was statistically associated with the rate of concealed carry permits in the state of Kentucky during the years 2005-2013. All variables were expressed in rates to permit us to control for population growth occurring during the time period in question.



In the trend studies, two linear regressions were performed - one for homicide, one for hospitalizations due to assault – wherein the independent variable was calendar year and the outcome was the proportion of all homicides or assault-related hospital discharges for which the mechanism of injury was a firearm. Chi-squared tests for linear trend were also performed.

Durbin-Watson tests for autocorrelation were conducted at lags of 1, 2 and 3 years. None of the resulting p-values were significant, leading to the conclusion that there is no evidence of autocorrelation in the data.

Breusch-Pagan tests for heterogeneous variances were also conducted. No evidence of heterogeneity was found.

## *Results*

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A simple linear regression was conducted to test the hypothesis that the concealed carry rate from 2005-2013 (n=9) is correlated with the rate of firearm-related homicides. Both variables were expressed as rates to control for population. (Figure 7)

The result is a failure to reject the null hypothesis, that there is no relationship between CCDW rate and the outcome. The observed homicide rates appear to be inversely related to the CCDW rate. However, given a p-value of 0.69 and an R-squared of 0.014, what little variation has occurred could be reasonably interpreted as random.

Consistent with the literature, the evidence of a correlation between CCDW rate and hospitalization for firearm-related assault is much stronger. (Figure 8)

The hospitalization trend was in the expected direction, demonstrating that for every 1% increase in concealed carry permit holders, firearm-related assaults could be expected to increase by 0.09 per 100,000 people, or approximately 4 cases per year across the state per 1% increase. The trend was not statistically significant ( $p=0.09$ ,  $R\text{-squared} = 0.21$ ), however the small sample size ( $n=9$  degrees of freedom) would likely preclude significance. The effect size ( $f^2 = 0.21$ ) suggests a small, but not trivial effect.

ED Visits were also considered, although data was only available for the six years between 2008 & 2013 ( $n=6$ ). Figure 9 shows the results of the linear regression, which fails to demonstrate a significant association between CCDW Rate and ED Visit Rate. ( $p = 0.59$ )

When looking at trends, are the number of firearm-related homicides or hospitalizations due to assault increasing in proportion to the total number of these incidents? We hypothesized that the annual increase in gun purchases and concealed carry increasing the ready availability of firearms would increase the proportion of violent crime incidents that were completed with firearms as opposed to other presumably less deadly weapons.

Figure 10 shows the proportion of firearm-related homicides as a function of the total number of homicides by year. The numbers trend slightly upward, but not to a level that achieves 0.05 statistical significance. ( $p = 0.12$ ,  $R\text{-squared} = 0.19$ ,  $\text{Chi-squared} = 3.05$ )

Once again, the numbers were far more striking for hospitalizations. Figure 11 shows firearm-related hospitalizations due to assault as a proportion of the total number of hospitalizations due to assault by year from 2000-2013.

We observed a significant upward trend in the number of firearm-related hospitalizations as a proportion of the total number of hospitalizations due to assault between the years of 2000-2013. ( $p = 0.006$ ,  $R\text{-squared} = 0.48$ ,  $\text{Chi-squared} = 10.18$ ) A large effect size ( $f^2 = 0.92$ ) was observed.

### *Limitations*

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These results must be considered in light of some serious methodological limitations. First and foremost, the results are susceptible to all of the criticisms, biases and limitations commonly associated with ecological or exploratory research of this type.<sup>37</sup> The data provides a snapshot of the health issue in question - namely trends in firearm-related homicide and assault in the state of Kentucky - but does nothing to establish cause.

Second, due to the lack of KVDRS data prior to 2005, the linear regressions utilized to correlate CCDW rates with violent crime rates are severely under-powered. With such a small sample size ( $n=9$  degrees of freedom), there is very low power to detect any significant statistical associations. The trend studies examine a longer span of time (2000-2013), increasing the power ( $n=14$ ).

Regardless, the magnitudes and trends demonstrated in the analysis are best interpreted qualitatively.

While an upward trend was found between the total number of concealed carry permits and incidents of firearm-related assault, they do not achieve significance at the 0.05 level and there are a number of variables could have confounded the result. Criminologists typically point to incarceration rate (up during this period) and arrest rates as factors in violent crime rates, while economic factors such as unemployment and poverty (both up during this period) are also considered relevant. Ideally, demographics would also be considered, particularly the percentage of black and white males between the ages of 18 and 40, the age group most highly associated with these types of violent criminal activities. This demographic grew by only 0.5% during this period, even as the total population grew by nearly 6%. Controlling for this demographic trend could greatly impact the result of this study.

There are also some serious limitations in the data that was analyzed. KVDRS data for homicides met our criteria best, but data was only available beginning in 2005, limiting the scope of our study. KVDRS data is occurrence data, while the KIPRC data we analyzed counts only Kentucky residents. In future studies, occurrence data should be considered preferable. It is only relevant the crimes that occur within the state of Kentucky, under the auspices of Kentucky law, and regardless of the state of residency of the victim. A victim of violent crime is influenced not by the laws of his or her state of residency, but by the laws of the state in which the crime has been perpetrated. Similarly, Kentucky residents injured in other states should not be included in a study of this nature.

Kentucky data as reported by the Kentucky State Police or the Federal Bureau of Investigation were found to be inconsistent over the years covered in this study, with significant outliers and large shifts in agency reporting standards impacting the numbers that were reported.

Kentucky state laws forbidding public access to concealed carry permit holder information further inhibited this research project. Ideally, we would have been free to look at the demographic characteristics of concealed carry holders, or to link specific violent crime incidents with the license holding status of the assailant.

## *Discussion*

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Firearms are more present than ever in the state of Kentucky. FBI statistics on annual instant background checks, the best proxy we have for firearm sales (for which records are not kept), show that the annual number of background checks in this state is 10 times what it was just a decade ago. Nearly 2.5 million checks were conducted at the point of sale in 2014, a staggering number nearly equal to the 3.4 million residents in the state 18 years of age or older and legally eligible to purchase firearms. The actual number of guns sold could be well in excess of this number.

Equally dynamic is the number of concealed carry permits that have been issued in Kentucky over the past decade. Where there were roughly 90,000 permit holders in 2005, there are more than 320,000 in 2014. That is approximately one out of every twelve Kentucky residents 18 and older that are now certified to

carry firearms concealed on their person in virtually any and every public setting. If current growth trends continue, more than half of the adult population would be armed by 2028.

Nationally violent crime is down, but in Kentucky it has essentially held steady. The FBI published a report showing the decreasing numbers for violent crime and we added Kentucky numbers for comparison purposes (Figure 12).<sup>38</sup>

Homicide rates are down 16 percent nationally, but only 8.7% in Kentucky. Aggravated assault rates, down 11.8% nationally, have actually increased slightly within the state.

Just as we do not know what is causing violent crime to decrease on the national level, we do not know why the decrease is not as prominent in Kentucky. The results of this study, however, showing an upward trend for firearm-related assaults, hint that the dramatic proliferation of firearms and concealed carry permits could be a factor.

Future research should be wary of the data compiled by state police agencies and the Federal Bureau of Investigation. In 2011 in Kentucky, the format was revised for reporting crime data, the result of which was the exclusion of many of the state's most largely populated urban areas from the totals that have been reported. Did this also happen in other states? How much of the falling national violent crime statistics could be explained by changes in data reporting formats?

This study hints at some trends and correlations that suggest a need for further research. A more robust research model would control for such variables as poverty rate (up between 2008 & 2013), unemployment (up and then down), incarceration rate (up) and the number of black and white men between the ages of 10 and 40. This last variable is of particular interest. The number of males between the ages of 10-40, the population by far the most likely to commit violent crimes, has held steady over the past decade even as the total population has increased by nearly 6%. That means that relative to the total population, the demographic most associated with violent crime is shrinking. Controlling for changes in the size of this demographic group could make a significant difference in the associations our study hints at between concealed carry and injuries due to assault. The literature supports this assumption.<sup>20</sup> In many studies, significant associations are revealed between concealed carry law and aggravated assault when state crime trends and economic trends are controlled for in the model.

With access to data on concealed carry permit holders, we could look at demographic trends and control for race, gender or income. We could look directly at the number of violent crime incidents that involved concealed carry holders and look for changing trends. Unfortunately, the gun lobby and the state's political leaders passed legislation to forbid public access to all of this data.

The one significant finding of the study, a growing number of firearm-related hospitalizations as a proportion of the total number of hospitalizations due to assault, suggests that the national decline in aggravated assault might be experienced in Kentucky as well were it not for the increasing number of firearm incidents. It also suggests that the severity of injuries in firearm-related assaults may be greater than those incurred without the ready availability of said weapons.

Monitoring the impact of a dynamically changing landscape where the prevalence and availability of firearms is rising significantly is the responsibility of the public health community. The literature referenced above suggests that concealed carry has an impact on firearm-related injuries in a community. As the number and scope of CCDW permit holders expands, we may reach a point where the association becomes significant, where guns are so omnipresent in the public arena that arguments quickly escalate into violence, injury and death.



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## *Biographical Sketch*

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Inspired by his father, a pediatrician at UK with an MPH and career focused on global health, Travis Young enrolled in the College of Public Health in 2011 hoping to complete a mid-career non sequitur, fleeing the world of automotive manufacturing into something more personally fulfilling.

He earned a Bachelor degree in Anthropology at Transylvania University in 1995, adopting a discipline that would fuel nearly a decade of wanderlust, taking him across more than 30 countries. Teaching English in a remote mountain village in Japan, he fell in love with the culture and the language and with the young woman that would eventually become his wife. Returning to the United States in 2003, he began a career in Japanese interpreting that would lead to customer relations, sales and upper management.

Travis currently serves as Senior Manager in charge of Sales and Engineering at a Japanese robotic integration company in Frankfort, Kentucky.

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## Appendix I: Figures

Figure 1:

Annual FBI NICS Background Checks for Firearm Purchase KY, 2000-2014

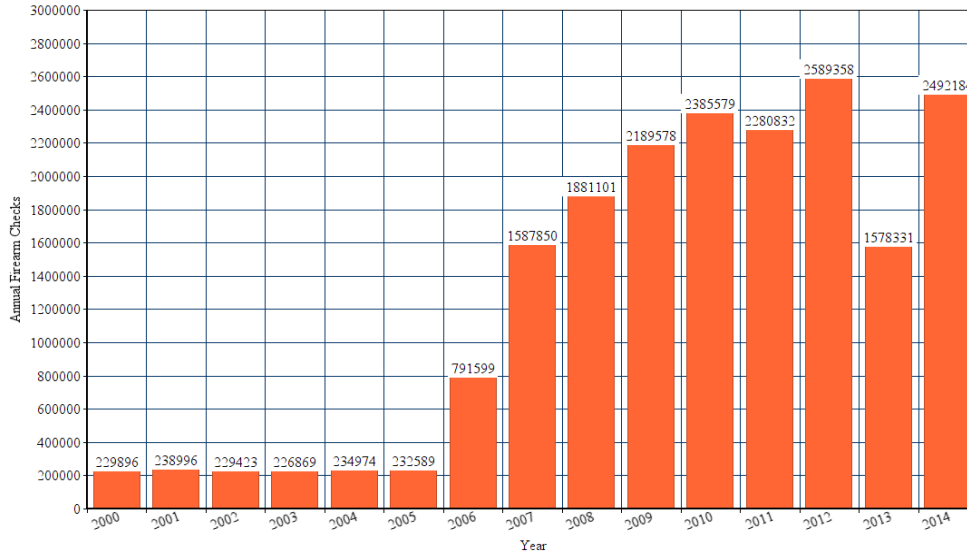


Figure 2:

Map Showing Nationwide Adoption of Concealed Carry Laws

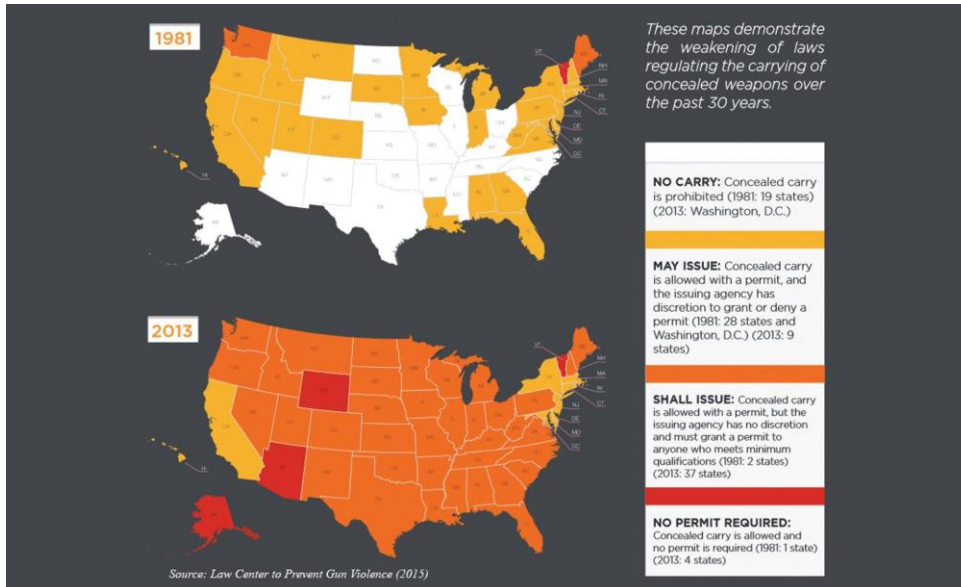
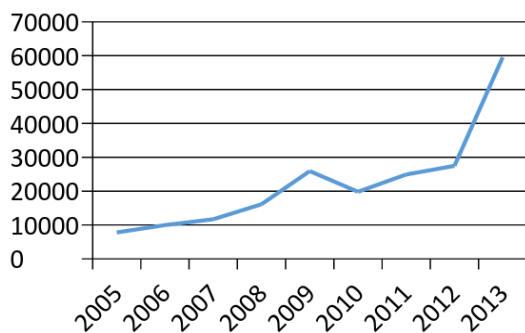


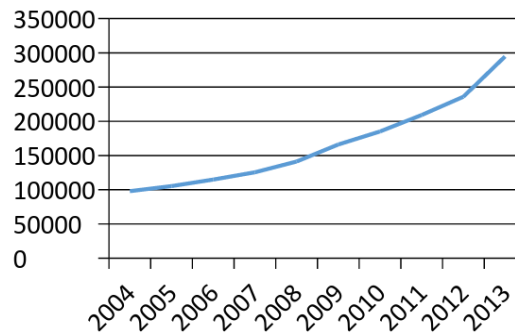
Figure 3: Amendments to Lessen Restrictions on KY CCDW Laws Since 2005<sup>12</sup>

- Active and honorably discharged military personnel no longer required to undergo training on state laws related to legal liability and the use of deadly force.
- Domestic violence victims can receive a temporary, 45-day permit without completing the normally required training on firearms safety and state law.
- Firearms may be stored in more places about a vehicle — including center consoles and seat pockets — without being considered concealed. (2011, HB213)
- Employers cannot prevent employees from keeping guns in their car while at work. (2011, HB213)
- Officials required to process applications within 30 days, down from 90. (2013, SB150)
- Public access to CCDW holder information forbidden, and access to the information by law enforcement restricted.
- Six-month state residency requirement eliminated. (2013, SB150)
- Gun owners permitted to carry concealed weapons without a license on property they lease or own, or on property leased or owned by a relative. (2012, HB72)
- Retired peace officers and prosecutors permitted to carry in most locations throughout the state, including courthouses and bars. (2014, HB99)

**Figure 4: CCDW Permits Issued Annually in KY, 2005-2013**



**Figure 5: Total Kentucky CCDW Permit Holders, 2005-2013**



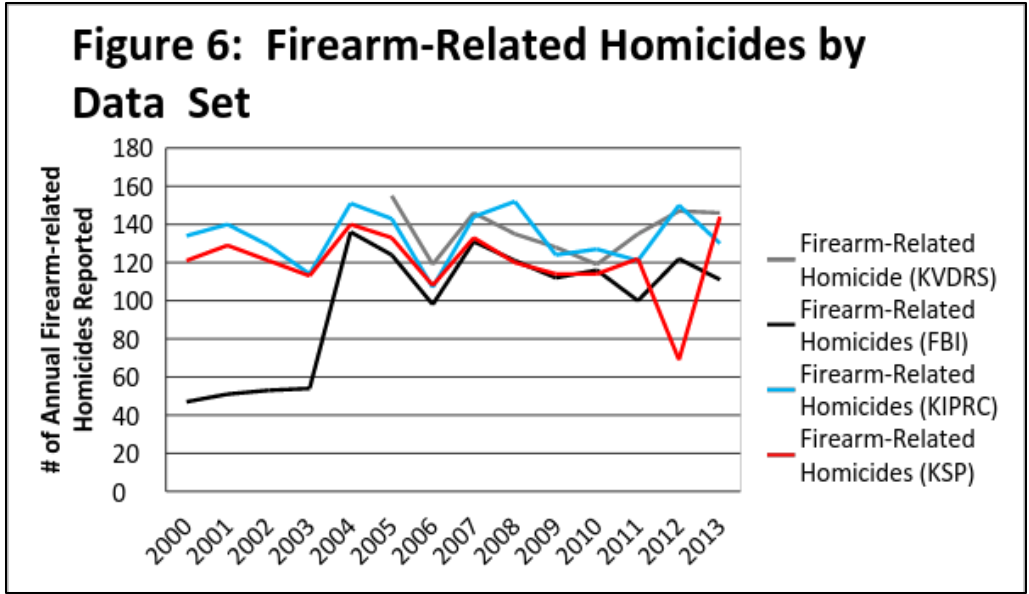


Figure 7: Firearm Homicide Rate vs. CCDW Rate

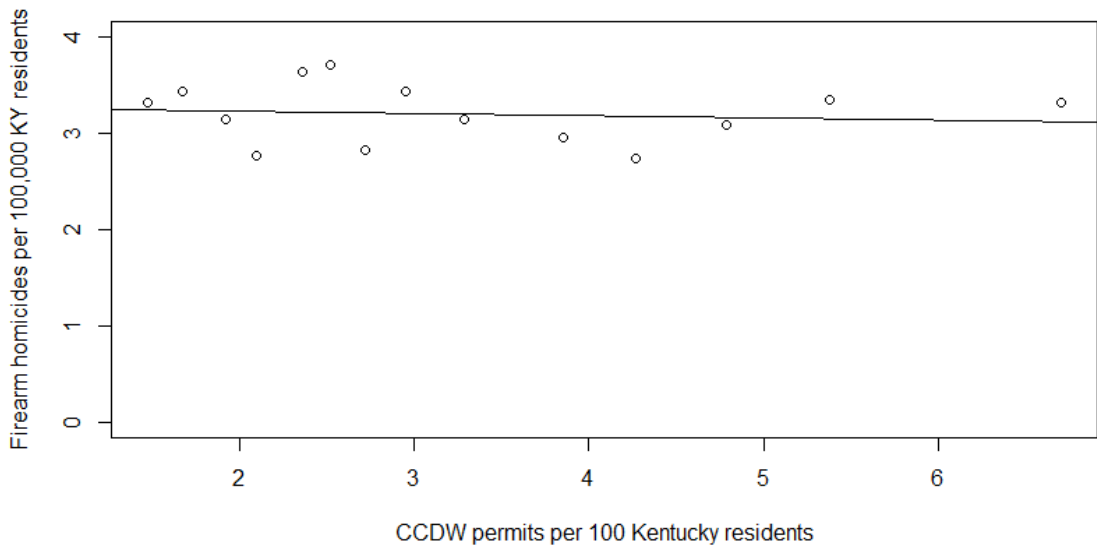




Figure 8: Firearm Hospitalization Rate vs. CCDW Rate

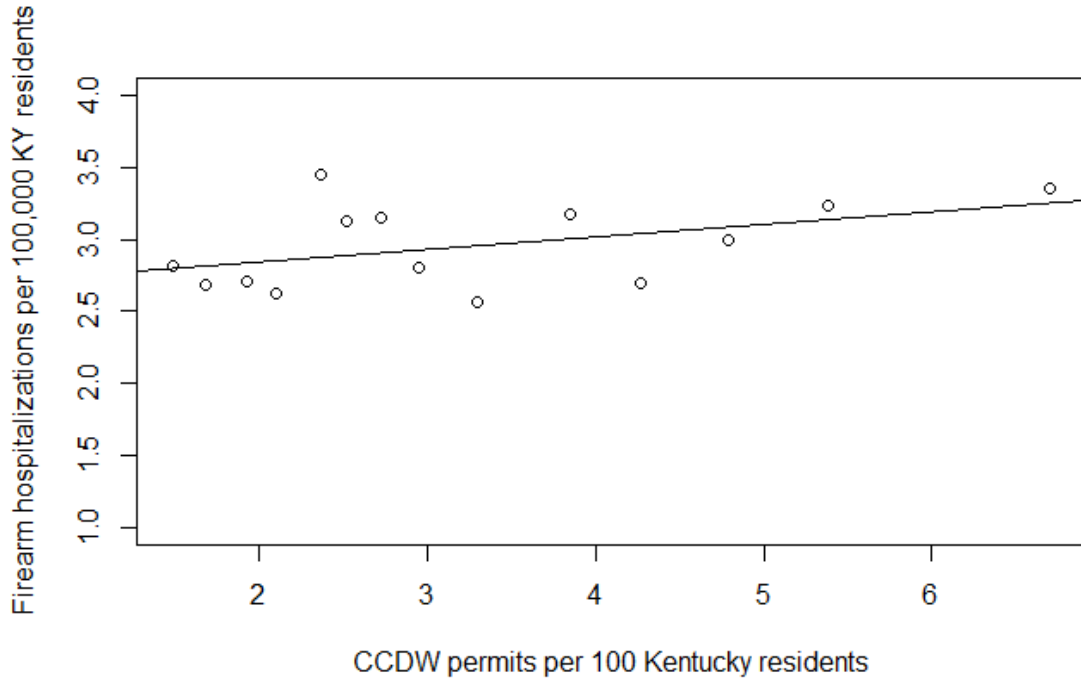


Figure 9: Firearm ED Visit Rate vs. CCDW Rate

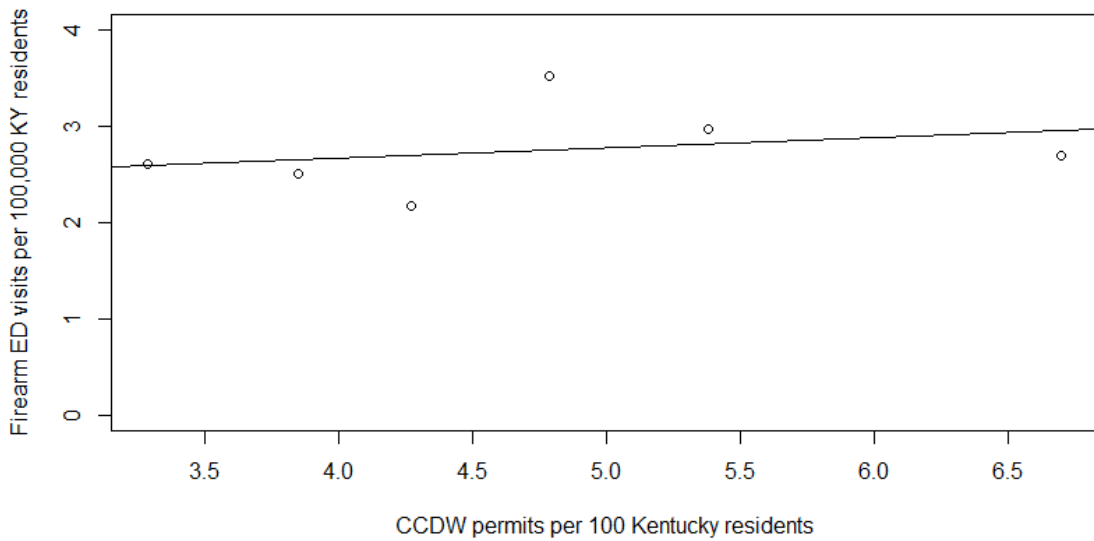


Figure 10: Firearm Homicides as Proportion of Total # of Homicides, 2000-2013

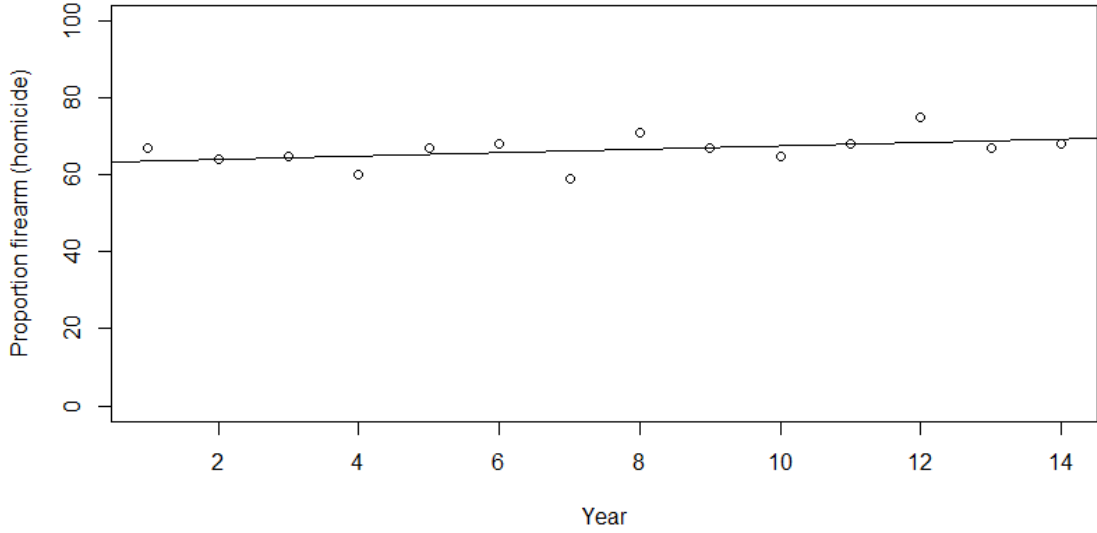


Figure 11: Firearm Hospitalizations due to Assault as Proportion of Total # of Hospitalizations due to assault, 2000-2013

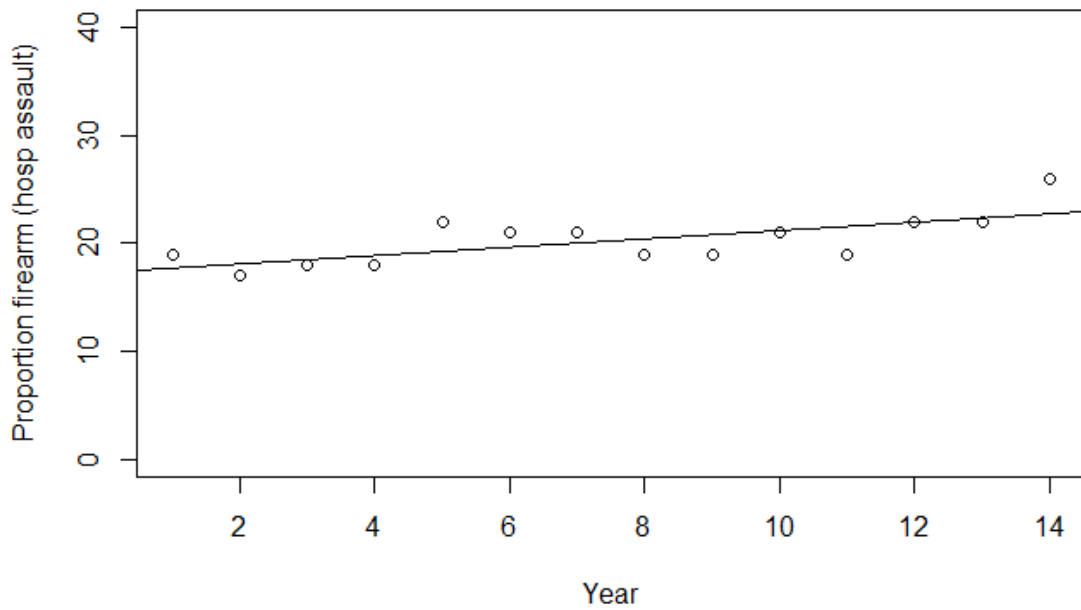


Figure 12: Violent Crime Trends, National vs. Kentucky, 2005-2012

**Figure 12**  
**Crime in the United States**  
 by Volume and Rate per 100,000 Inhabitants, 2005–2012

Year	US Population <sup>1</sup>	Violent crime	Violent crime rate	KY Population <sup>1</sup>	NATIONAL		KENTUCKY		NATIONAL		KENTUCKY	
					Murder and nonnegligent manslaughter	Rate	Murder and nonnegligent manslaughter <sup>2</sup>	Rate	Aggravated assault	Rate	Aggravated Assault <sup>3</sup>	Rate
2005	296,507,061	1,390,745	469.0	4,182,742	16,740	5.6	229	5.5	862,220	290.8	5685	135.9
2006	299,398,484	1,435,123	479.3	4,219,239	17,309	5.8	202	4.8	874,096	292.0	5996	142.1
2007	301,621,157	1,422,970	471.8	4,256,672	17,128	5.7	207	4.9	866,358	287.2	6618	155.5
2008	304,059,724	1,394,461	458.6	4,289,878	16,465	5.4	203	4.7	843,683	277.5	6749	157.3
2009	307,006,550	1,325,896	431.9	4,317,074	15,399	5.0	196	4.5	812,514	264.7	6382	147.8
2010	309,330,219	1,251,248	404.5	4,339,349	14,722	4.8	176	4.1	781,844	252.8	5691	131.1
2011 <sup>3</sup>	311,587,816	1,206,005	387.1	4,370,038	14,661	4.7	180	4.1	752,423	241.5	6118	140.0
2012	313,914,040	1,214,462	386.9	4,383,465	14,827	4.7	219	5.0	760,739	242.3	5800	132.3

<sup>1</sup> Populations are U.S. Census Bureau provisional estimates as of July 1 for each year except 2000 and 2010, which are decennial census  
<sup>2</sup> Source = KVDRS  
<sup>3</sup> Source = Kentucky State Police Annual Crime Reports. 2011~2012 numbers include all summary agency totals.

**Table 1A**  
**Crime in the United States**  
 Percent Change in Volume and Rate per 100,000 Inhabitants

Years	Violent crime	Violent crime rate	Murder and nonnegligent manslaughter	Rate	Murder and nonnegligent manslaughter	Rate	Aggravated assault	Rate	Aggravated Assault	Rate
2012/2011	+0.7	*	+1.1	+0.4	21.7	21.3	+1.1	+0.4	-5.2	-5.5
2012/2005	-12.7	-17.5	-11.4	-16.1	-4.4	-8.7	-11.8	-16.7	2.0	-2.6