

YOUTH ACQUISITION AND CARRYING OF FIREARMS IN THE UNITED STATES: PATTERNS, CONSEQUENCES, AND STRATEGIES FOR PREVENTION*

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I. Illegal Gun Acquisition Among American Youth

U.S. federal law bars youth under age 18 from purchasing firearms or possessing handguns. It also establishes a minimum age for purchasing handguns at 21 if the seller is a licensed firearms dealer and at 18 if the seller is a private seller. Yet American juveniles are still able to purchase, possess, and carry firearms.¹ And many older youth who are legally barred from acquisition and possession due to disqualifying convictions nonetheless acquire and possess firearms.² This section, after explaining the operation of the gun market, legal and illegal, explains the sources used to study the youth gun market and the manner in which youth acquire firearms.

Cook and Wintemute have each described the legal firearms market and its connection to the illegal firearms market.^{3,4} Federal and state laws govern the legal market, requiring firearm manufacturers and sellers to account for their guns and gun transactions with mandatory use of serial numbers, pre-sale background checks, and record-keeping to prevent guns from getting into the hands of prohibited persons, including juveniles. Firearms, once in the legal market, can be diverted into the illegal market in a number of ways including straw purchasers for prohibited persons, scofflaw licensed gun dealers selling guns “off the books,” gun traffickers in the business of selling guns to gangs and other criminals, and thefts from gun shops, homes, and motor vehicles. After a gun is diverted into the hands of criminals or to underage youth, it could change hands numerous times in a variety of ways – sales, trades for drugs, loans, or theft.

* The authors are responsible for the content of this article, which does not necessarily represent the views of the Institute of Medicine, or the National Academy of Medicine.

Unfortunately, there has been no published research that follows some reasonably representative sample of guns from the legal market to diversion and, finally, likely after several transactions, to final criminal users of the guns. Most studies of youth or criminal acquisition only measure the final step in gun acquisition. Other studies are able to examine only the initial sale or point of diversion.

A. Data Sources for Studying the Illegal Youth Gun Market

The two most common types of data used to study the youth gun market are youth interviews or surveys and traces of firearms recovered by police from criminal suspects. Youth or offender interviews and surveys generally help answer questions about the immediate method and source of a youth's firearm. Crime gun trace data, on the other hand, are better suited for investigating the initial diversion of firearms from the legal to the illegal market. Very little data exists that connects the dots from the initial retail transactions to acquisitions by criminals, especially if the firearm changed hands multiple times in private transactions. There has also been one large study of federal gun trafficking investigations involving youth that took place in the late 1990s that recorded and summarized illegal gun trafficking channels.

1. Offender Interviews and Surveys

This broad category refers to in-depth interviews and questionnaires targeted at delinquent youth, often incarcerated, that elicit information about the guns the youth previously acquired, the method by which the gun was acquired, and the actual source of the gun. Joseph Sheley and James Wright pioneered the use of this source to study firearm acquisition in their early 1990's study of male serious offenders in juvenile correction facilities and male students in inner-city high schools with a history of violent incidents near the correctional facilities.⁵ This sampling design was meant to capture those most at-risk of gun-related behaviors. Another survey provides a similar data source. The Survey of Inmates in State Correctional Facilities (SISCF) provides a nationally representative sample of inmates in state prisons, including individuals who commit serious crimes as juveniles.⁶ A study of New Mexico juvenile delinquents performs a similar function but for a smaller population.⁷ These large-scale surveys provide systematic, representative data on the methods and sources of firearm

acquisition. Their data, generally speaking, illuminate the methods and sources that juveniles use to acquire firearms. The pathways that these guns took since illegal diversion, however, remain obscure in these studies. Offenders themselves likely do not even know the origins, much less the intervening owners, of their firearms.

There are also more idiosyncratic, though richer, sources in this category. One such source is open-ended interviews with delinquents in Maryland juvenile detention centers. These thorough interviews allowed researchers to understand the differences in method and source of acquisition between a juvenile's first firearm and more recent firearms, an advantage not shared by other studies.⁸

2. Firearm Traces

Modern U.S. firearms all have an initial paper trail that connects a particular gun's unique serial number to a manufacturer, place of initial sale, and initial purchaser. This serial number enables the FBI to trace guns recovered from criminals or crime scenes. The traces can then inform law enforcement officials and other interested parties about the sources of crime guns. Several studies have studied the youth gun market with trace data. Reports by the FBI in the late 1990's, part of the Youth Crime Gun Interdiction Initiative, exploited firearms trace data from a multitude of jurisdictions to describe patterns of gun acquisition by youth.⁹ Researchers outside of government have also used firearm trace data as a means of studying youth gun acquisition.^{10,11} Firearm trace data naturally reveal much about the origins of youth crime guns. For instance, guns recovered from youth aged 21-24, on average, have a shorter time-to-crime (an indicator of trafficking) than guns recovered from adolescents or 18-20 year olds.¹⁰ Yet, the paper trail often ends after the initial legal sale, providing little concrete information about exactly how the gun is diverted to the illegal market or how the youth acquires the firearm, but findings from this source can still be suggestive. This source, then, is a necessary, but incomplete, means of studying the youth firearms market.

3. Firearm Trafficking Investigations

The Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) initiates investigations on firearm trafficking. Their files provide a potentially rich source of

information on how youth acquire firearms and on the suppliers of the youth gun market. To our knowledge, only one study has used this particular source to study the youth gun market, though the study's results, which challenge conventional wisdom, make it especially valuable.¹² The primary limitation of the data from this study is that the U.S. Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) typically will only look for and investigate cases in which federal firearms laws have been broken and there is a good chance that those law violations could be effectively prosecuted. The firearms investigations data therefore creates a picture of the youth firearms market filtered by ATF's organizational tendencies, or, in other words, a non-random sample of the youth gun market.

This source can provide data on both stages of the youth gun market, though the extent to which firearm investigations data can describe either stage in a comprehensive and representative manner is open to debate.

4. Mixed Method Study of Chicago's South Side's Illegal Gun Market

Cook and colleagues conducted a ground-breaking study of the illegal gun market in Chicago using data from crime gun traces and surveys of arrestees. What was particularly unique about this study was the extensive ethnographic research that involved interviews and observations of a variety of actors, including youth, in the illegal gun market in Chicago's South Side.¹³

B. How Youth Acquire Firearms

1. Firearms Used Outside the Home

Scholars have extensively debated the relative importance of different diversion channels that eventually serve the youth gun market. Based on Sheley and Wright's large-scale survey of juvenile offenders and at-risk youth, early scholarship emphasized theft. Though this survey data provided only indirect data on the diversion stage of the gun market, researchers inferred that theft likely served as the most important conduit of guns possessed by youth.⁵ A recent report based on data from the National Crime Victimization Survey (NCVS) found that during the years 2005-2010, an average of

172,040 firearms per year were stolen from private residences, vehicles, or directly from residents.¹⁴ This estimate is down substantially from NCVS estimates of guns stolen per year at roughly 500,000 during the mid-1990s when gun ownership levels and crime rates were both much higher.³

Importantly, there has also been research into the size of this stage of the market. Some might reasonably wonder if there truly is a black market for youth seeking guns in the United States, a country where high firearm ownership rates potentially spell easy access, making a black market search unnecessary. Department of Justice data from the Survey of Inmates in State Correctional Facilities (SISCF) suggests that youth in the United States do indeed turn to a firearms black market. Webster and colleagues analyzed data on offender handgun acquisition from the SISCF for offenders who had used a firearm when committing the crime for which they were incarcerated.⁴ When those data are broken down by the age of the offender at the time of the offense, just under half of youth (46.7% of youth under age 18 years and 47.7% of youth ages 18-20 years) acquired the handgun from “the street or black market” and just over a third (37.5% for those under age 18 years and 35% for those ages 18-20 years) acquired their handgun from a friend or family member.

Table 1. Source of handgun by age at current offense (SISCF Data)

	Less than 18 (n=317)		Ages 18-20 (n=325)	
	N	%	n	%
FFL	8	2.5	28	8.6
Friends/ Family Member	119	37.5	114	35.1
Street/ Black Market	148	46.7	155	47.7
Gun Show/ Flea Market	1	0.3	4	1.2
Stolen/ Victim	41	12.9	24	7.4

The national survey data from the SISCF found that 37% of youthful gun offenders acquired the handguns they used in sales, trades, or loans from friends or family members. This is very similar to what Sheley and Wright found in their survey of

incarcerated juveniles.³ The late 1990s study of detained juvenile delinquents in New Mexico reported that 58% of their interviewees acquired a gun from a friend, parent, or relative.⁵ Similarly, interviews from the early 2000's with Maryland youth delinquents revealed that family and friends served as an important source of acquisition for a youth's first gun, though later guns were more likely to be acquired from other sources.⁶

There is evidence that straw purchasers, when compared to family and friends, play a less important role in the direct acquisition by youth of firearms. For instance, in-depth interviews with delinquent Maryland youth turned up only three cases of straw purchasing out of more than fifty gun acquisitions.⁶ Sudhir Venkatesh's South Side Chicago ethnography similarly showed that gang members and other members of Chicago's criminal underworld seem to rarely use straw purchasers. More commonly, gang leaders would supply guns to its members.¹³

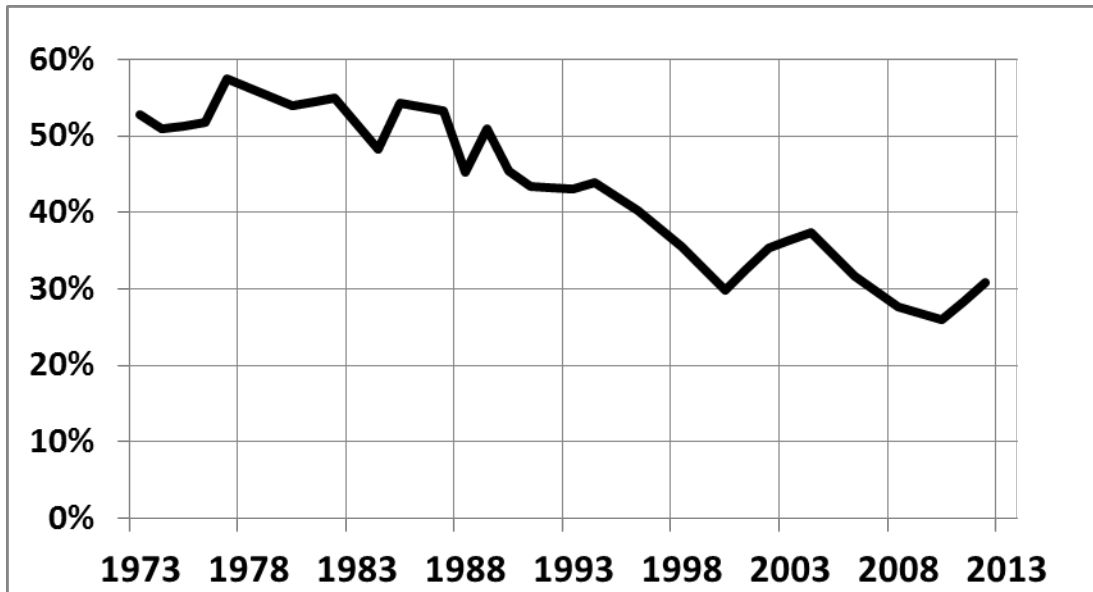
These findings, at first glance, contradict the results of Braga and Kennedy's study that used ATF firearm investigations involving youth and found a large role for straw purchasing.¹² The ATF investigation data, however, likely focus on cases easiest for investigators to identify and prosecutors to prosecute. Federal gun trafficking cases indicate that illegal or grossly negligent practices by gun dealers (e.g., facilitating illegal straw sales, falsifying sales records, selling guns off the books, conspiring with middle men traffickers), straw purchasers, and individuals selling large quantities of guns without a license to do so are the most important conduits of guns to criminals. Straw purchasing, thus, appears to play an important role in the diversion of guns into the illegal market and, because private firearms transactions are, for the most part, not regulated by federal firearms laws, are the most likely to receive attention from federal law enforcement.

2. Firearms Within the Home

The street is not the only environment in which American youth encounter firearms. Survey data indicate that 31% of homes with children and adolescents under age 18 have one or more firearms, but youths' exposure to guns in the home have declined dramatically during the past 25 years.¹⁵ Firearms used in teen suicides and unintentional shootings tend to come from their own home, a home a relative or friend.^{16,17} From 1999 through 2010, more than 10,000 teenagers and younger children in

the U.S. committed suicide with a firearm and nearly 1,900 died from unintentional shootings, a total of nearly 1,000 deaths per year.¹⁸ During the past decade, there have been 3,000 to 5,000 incidents of teens and children suffering nonfatal gunshots from unintentional shootings and suicide attempts.¹⁴ Among adolescents and young adults, access to a firearm greatly increases the risk of suicide^{19,20,21} as well as unintentional firearm deaths.^{22,23} Leaving guns loaded and unlocked further increases children's and adolescents' risk of unintentional shootings and suicide.²⁴

Graph 1. Firearm Ownership Rate in U.S. Households with A Child under 18 (Source: General Social Survey).



II. Gun Carrying Among American Youth

A. Connections Between Youth Gun Carrying and Lethal Violence

Youths carrying handguns outside the home poses greater risks that altercations and interpersonal conflicts involving youth result in lethal outcomes. Trends in youth homicide in the United States have closely tracked trends in youth gun carrying. Youth homicide rates rose dramatically during the late 1980s and early 1990s, declined rapidly from the 1994 to 1999, and have been relatively flat through 2012.²⁵ The dramatic fluctuations in youth homicide rates from 1985 to 1999 were specific to males and were most acute for black males.²⁶ Juvenile arrest rates for weapon-related crimes, principally illegal possession of a firearm, followed a remarkably similar temporal pattern.²⁷

There could be multiple explanations for this temporal correlation. It is impossible to completely control for assailants intentions and plans, but available evidence indicates that firearms tend to be far more lethal than knives, other personal weapons, or fists.²⁸ Adolescent males commonly get into interpersonal conflicts and confrontations with other young males. Increased gun carrying in this context is likely to lead to more gun violence and, thus, more lethal violence. Importantly, greater gun carrying and the gun violence that results are likely to spur even more gun carrying and gun violence as gun violence spreads through social networks in a process similar to an infectious disease.²⁹ Thus, more youth gun carrying can be both a cause and an outcome of more gun violence involving youth. How strong the causal arrow is in either direction will determine whether efforts to suppress youth gun carrying will lead to significantly less gun violence involving youth. Gun carrying is more common among youth who are involved in gangs and criminal activities such as selling illicit drugs.^{30, 31,32} Therefore, a strong association between gun carrying and serious violence could be confounded by the behavior's link to other risk behaviors, attitudes, and social contexts.

B. Measuring Gun Carrying Among Youth

Research on youth gun carrying draws on three types of data sources: national surveys, longitudinal, city-specific studies, and focused, “at-risk” population studies. For each source, we discuss these tradeoffs and other relevant characteristics.

1. National Data on Youth Gun Carrying

Research on the association between firearms and juveniles has yielded varying results and interpretations, partly due to the difficulty of measuring that association using consistent definitions that reflect the most dangerous forms of youth gun carrying (concealed handgun carrying, especially in high-risk contexts) and truly representative samples of youth in America. Most of the research on youth gun involvement – which includes access, possession, acquisition, ownership, carrying, or use – has been limited to subpopulations of youth and are not based on nationally representative samples.³³ Surveys and analyses have largely been conducted in schools or juvenile justice treatment facilities, thus excluding adolescents that do not attend schools, for instance, or may represent youth with higher-than-average risk for gun involvement.^{30, 31, 32}

The only national (U.S.) survey that routinely measures youth gun involvement – specifically, gun carrying - is the Youth Risk Behavior Surveillance System (YRBSS), run by the Center for Disease Control and Prevention (CDC).³⁴ Conducted biennially beginning in 1991, the YRBSS monitors six health risk behavior categories, including behaviors associated with violence and unintentional injuries, and is administered to thousands of youth in grades 9-12 using nationally representative sampling. The YRBSS item of greatest interest is one that asks, “During the past 30 days, on how many days did you carry a gun?” The response categories are: a) 0 days; b) 1 day; c) 2 or 3 days; d) 4 or 5 days; and e) 6 or more days. The problem with this item is that it lacks important contextual information. The risk of gun violence stemming from a teenager carrying a rifle while hunting with his father is very different from that of another teenager carrying a handgun when he is hanging out with friends who are drinking alcohol, using or selling drugs, or engaged in other delinquent behaviors. Yet both scenarios would yield the same response to the YRBSS item.

While the YRBSS collects data from a very large sample of youth, its sampling of students attending high school excludes youth who are likely to be at greatest risk for involvement in risky gun carrying and gun violence – those who have dropped out of school or who are regularly absent from school.

The adolescent sample in the 2008 National Survey on Drug Use and Health (NSDUH) and the 1995 National Survey of Adolescent Males (NSAM) also provide estimates of youth handgun carrying. Because these surveys specifically ask about handgun carrying, these studies provide a source for national data on high-risk youth gun carrying. The 2008 NSDUH survey asks about handgun carrying in the past year among youth aged 12-17. A comparison between the NSDUH and the YRBSS is revealing. The 2007 and 2009 YRBSS data, which uses an item that cannot separate hunting and other shooting sports experiences from handgun carrying, show rates of adolescent gun carrying (5.2% to 5.9% for all adolescents and 9.0% to 9.8% for male gun carrying) to be much higher than the handgun carrying measure of the 2008 NSDUH (3% of youth and 5% of males carried a handgun in the past year).³⁵ The 1995 NSAM, which asked about handgun carrying in the past month, found a prevalence of 10.4% for males.³⁶ The NSAM estimate of 10.4% carrying handguns is slightly lower than the male-only estimate of any gun carrying in the 1995 YRBSS (12.3%).^{34,36}

2. Longitudinal, City-Specific Studies

Longitudinal studies follow the same youth for many years, allowing researchers to examine the causal order of risk behaviors, including gun carrying, and enabling relatively rich data collection. For instance, the Mobile Youth Survey of adolescents in Mobile, Alabama has served as the test bed for theories on initiation of youth-gun carrying and the role of gang membership, perpetration, and victimization.^{37,38,39,40} Cross-sectional studies lack this crucial time dimension and often do not include the many possible covariates of gun carrying. Other city-wide studies used to study youth gun carrying include the Rochester Youth Development Study and the Chicago Project on Human Development.^{41,42} The external validity of these studies, however, suffers in comparison to national surveys.

3. Focused, “At-Risk” Population Studies

Studies of “at-risk” populations survey a population believed to carry guns at an extremely high rate. This population could be those convicted of firearm offenses, juvenile delinquents, or members of a particular neighborhood. For instance, Wilkinson et al. interviewed 400 violent youth in New York City to study patterns of gun carrying.⁴³ Results from these samples cannot neither be generalized to the wider population nor used for causal analysis unless data is collected longitudinally, but these studies and their use of in-depth questionnaires and open-ended interviews are conducive to a rich understanding of those who carry guns.

C. Prevalence and Trends of Adolescent Gun Carrying

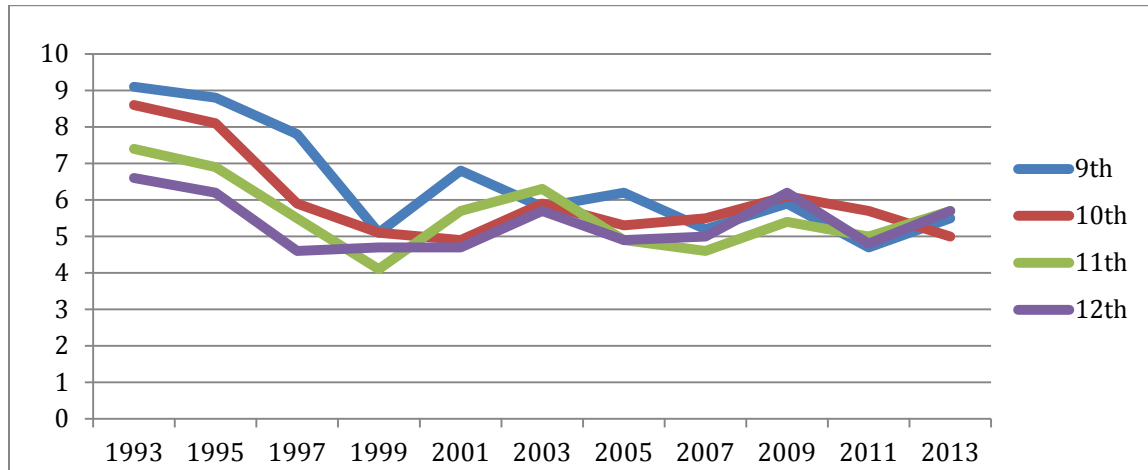
Gun carrying among adolescents in the United States was the highest in 1993, when 7.9% of 9-12 graders reported carrying a gun at some point in the past 30 days. The rate dropped significantly between 1995 and 1997 (7.6% to 5.9%, $p=0.02$) and has remained relatively constant since.²⁸ The decrease in juvenile gun carrying is consistent with data suggesting that overall weapon-related arrests among juvenile (under age 18) offenders decreased significantly in the mid- to late 1990s. [citation] In 2013, approximately 5.5% of high school students reported gun carrying in the past 30 days. Approximately 5% of students ages 12 to 18 years reported having access to a loaded gun without adult permission during the 2011 school year, down from 6% in 2009 and 7% in 2007.⁴⁴

1. Gun Carrying by Age/Grade

Between 1993 and 2001, there is an inverse relationship between grade and the prevalence of gun carrying based on YBRSS data. But from 2003 to 2013, differences by grade largely dissipated.²⁸ Because cumulative dropouts within a cohort increase over time, each successive grade includes fewer high-risk youth who might be prone to carrying guns illegally. Large population studies such as the Chicago Project on Human Development that survey youth both in and out of school find significant increases in concealed gun carrying as adolescents age.⁴² For example, concealed gun carrying

increased from 2.2% for ages 13-15 to 8.2% for ages 16-19. Note that handgun ownership was essentially banned in Chicago at the time of the study.

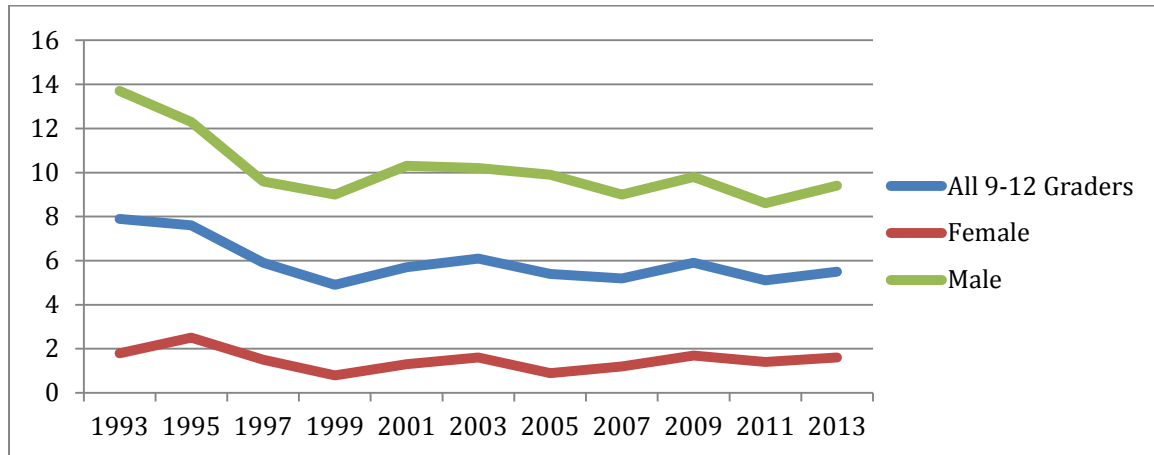
Figure 2. Percentage of high school students who carried a gun in prior 30 days by grade, United States, 1993-2013. (Source: YRBSS)



2. Gun Carrying by Sex

Male juveniles are far more likely to be involved with firearms than females. In 2013, 9.4% of male high school students reported carrying a gun in the past 30 days, compared to 1.6% of female students. For males, gun carrying was highest in 1993 (13.7%) and declined to 9.6% in 1997 and has fluctuated between 9% and 10% through 2013. There has been little change in gun carrying among girls during the past 20 years.⁴⁵ Other studies have shown that male gun carrying varies greatly between samples; some studies find male gun carrying to be as low as 3%³⁰ or as high as 40-50%^{45,46} and 80% to 90%⁴⁷ among violent juvenile male offenders.

Figure 3. Percentage of high school students who carried a gun in prior 30 days by sex, United States, 1993-2013. (Source: YRBSS)



3. Adolescent Gun Carrying by Race

Much of the research on juvenile gun carrying shows that minorities, and in particular blacks and Hispanics/Latinos, have higher rates of gun carrying than their white counterparts.^{8,30,42,48} In 2013, white adolescent self-reported gun carrying was higher than that for all other races for the first time in 20 years, though the difference was not statistically significant. In 1993, at the peak of the youth firearm homicide epidemic experienced most acutely by black males, 1 in 5 black male high school students reported having carried a gun during the last 30 days, a proportion twice as high as that of white males. The prevalence of gun carrying among black males dropped by more than half from 1993 to 2003. Reported gun carrying among Hispanic males dropped by half between 1995 and 1997. Except for a spike in reported gun carrying by black males in the 2009 YRBSS, male gun carrying practices have been stable and similar across racial/ethnic groups.²⁸

4. Socioeconomic Status and Adolescent Gun Carrying

YRBSS data on gun carrying have not been reported by any direct measure of SES. There is limited data on the effect of socioeconomic status on juvenile gun carrying, and the data are not conclusive. Callahan and Rivara (1992) found that juveniles of lower SES generally had higher levels of gun carrying than did those of higher SES⁴⁹, while

Molnar et. al (2004) and Carter (2013) found no relationship between SES and gun involvement.^{33,50}

Graph 5. Percent of male high school who carried a gun during prior 30 days by race, United States, 1993-2013. (Source: YRBS)

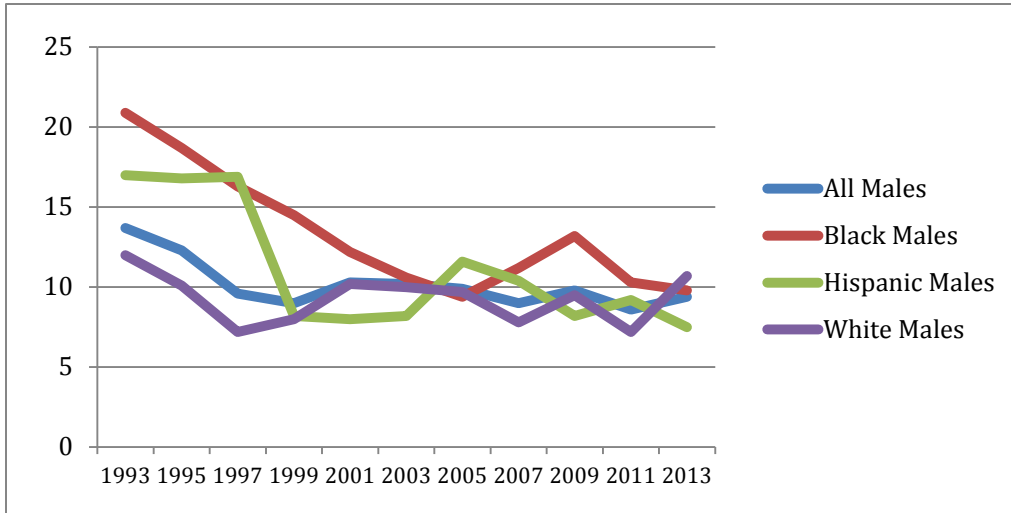
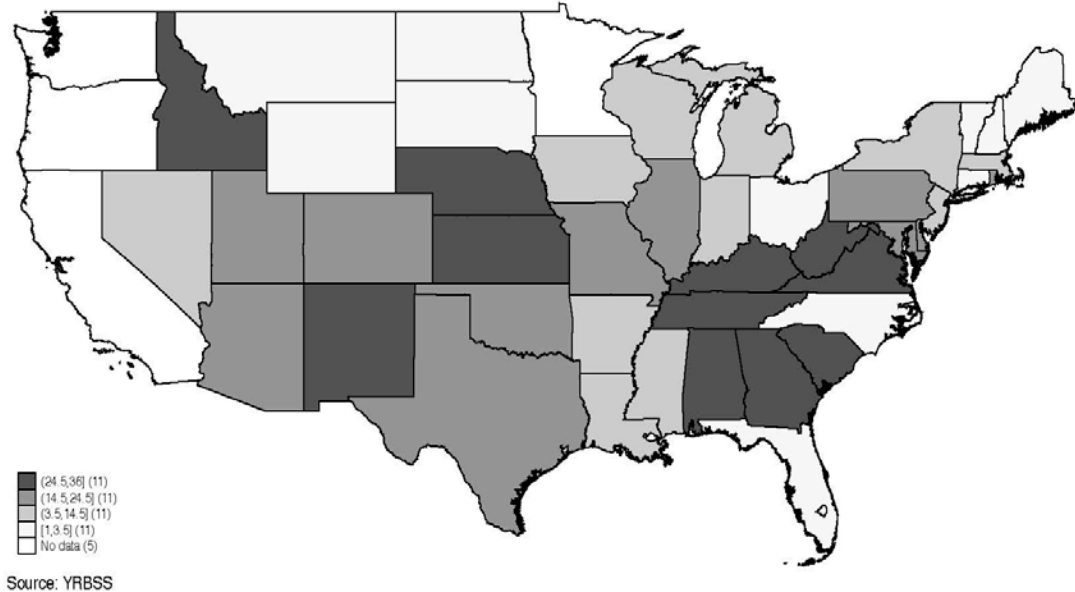


Figure. 1 Percentage of Youth That 'Carried A Gun' in the Last Thirty Days by Quartile



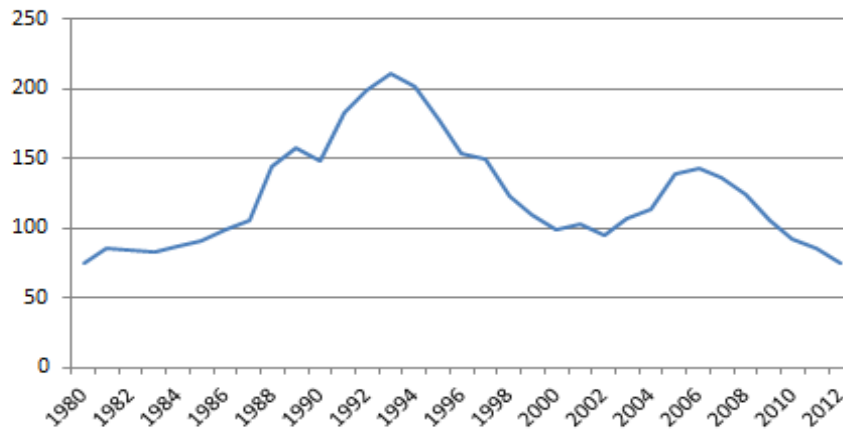
5. State/Region of Country

Data are limited in scope and do not allow for reliable comparisons of juvenile gun carrying by state or region. Reporting to the Youth Risk Behavior Surveillance System (YRBSS) is voluntary. Only 46 states have been represented in at least one YRBSS report since 1993, and a number of those states have intermittent data. Though all 50 states are not represented there appears to be higher rates of juvenile gun carrying in the Southeast, Southwest and Rocky Mountain regions, and lower rates of juvenile gun carrying in the New England and the Northeast. These regional differences in adolescent gun carrying correlate with those observed for household and individual gun ownership prevalence and are likely to be influenced by regional differences in hunting among youth.

6. Juvenile Arrest Rates for Weapon Offenses

Arrests for weapon-related offenses (the vast majority are for illegal gun possession) reveal the same dramatic reduction in adolescent gun carrying occurring from 1993 to 2000. However, juvenile gun carrying arrests per 100,000 population increased by 51% from 94.7 in 2000 to 143.3 in 2006 and then declined steadily to 75.2 in 2012, 48% lower than the 2006 rate.⁵¹ This measure of adolescent gun carrying more directly measures high-risk gun involvement and is not limited to school populations, it is impossible to discern the degree to which changes reflect differing levels of gun carrying versus differing levels of enforcement. Juvenile arrests rates for any crime and especially for drug-related crimes have declined significantly during the post-economic recession period of 2008-2012 and may reflect some reductions in police activity due to budget constraints on local governments. Consistent with the notion some of the recent downturn in weapon arrests for juveniles is due to law enforcement changes, the percentage of arrests of juveniles that are for weapons offenses declined only slightly from 2007 to 2012.

Juvenile arrest rates for weapon offenses
per 100,000 pop., FBI, UCR, 1980-2012



D. Determinants of Adolescent Gun Carrying

1. Gun Availability

Demographic correlates provide a picture of how adolescent gun carrying varies across sub-groups, but provide limited insights into what factors facilitate or inhibit this behavior. The general availability of guns, measured in terms of gun ownership prevalence or proxy indicators of gun ownership, appear to be an important determinant of whether an adolescent carries a gun. Gun availability at the aggregate level is correlated with adolescent gun carrying. Garen Wintemute used YRBSS data and found that for each percentage point increase in a proxy for gun ownership, adolescent gun carrying increased by 0.18 percent.⁵² Phillip Cook and Jens Ludwig subject to a rigorous test the proposition that rates of gun ownership among the general population are related to youth handgun carrying. By using micro-data from the National Survey of Adolescent Males and a variety of statistical tests, including a placebo test and a two-stage least squares regression, the researchers create a strong case that gun ownership has a direct causal effect on increasing adolescent handgun carrying.⁵³

The link between youths' access to guns and gun carrying can also be examined in more direct ways. Molinar's study of concealed gun carrying among adolescents in Chicago found that 5.7% of youth living in a home with a gun carried a concealed gun compared to 2.7% of youth in homes where there were no guns. Unfortunately, this data

were not collected or presented in a way that could distinguish guns owned by the adolescent versus guns owned by other family members in the home. Handguns acquired and owned by adolescents may have less to do with home access than with the youth's desire to carry a gun for protection against criminal attacks or for use in crime. Unlike in most U.S. homes, the presence of a gun in the home in this study is likely to be possessed illegally because Chicago's laws banned nearly all gun ownership.

2. Delinquent / Criminal Behavior

Numerous studies have found that juvenile gun carrying to be associated with a number of delinquent behaviors, including alcohol and substance use^{41,54}; fighting³³; gang membership⁵⁵ and drug selling.⁵⁶ Rates of gun carrying are much higher among violent juvenile offenders than those who do not report violent behavior.

Trends for juvenile arrests for drug offenses during 1980-2012 mirror those for weapon offenses.⁵¹ Recent work by Ruggles and Rajan (2014) persuasively demonstrates the high correlation between a range of drug and alcohol risk behaviors and youth gun carrying. Using YRBSS data and reviewing a broad range of health and safety risk behaviors, they report that drug and alcohol risk behaviors are the strongest correlates of adolescent gun carrying. Eight of the top ten correlates of gun carrying in their study are drug- and alcohol-related and include having ever used/injected drugs, ever used heroin, and ever used cocaine.⁵⁷

Drug selling is likely to be more important than adolescent drug use as a risk factor for illegal gun carrying by youth. Michael Vaughn et al., used data from the NSDUH and report that youth who sell drugs are nearly sixteen times more likely to carry a handgun than youth who do not sell drugs.³⁵ Evidence from the Rochester Youth Development Study supports this link between drug-selling and gun carrying. While joining a gang in this cohort most commonly precipitated gun carrying and elevated the odds of gun carrying eight-fold, selling a lot of drugs became the chief determinant of youth gun carrying during late adolescence, elevating the odds of gun carrying by 14-fold.⁴¹ Youth who sell drugs, often on the front lines, are vulnerable to robbery as well as to attacks by rival drug selling groups. Young drug sellers report that their risky enterprise necessitates ready access to a firearm, either carrying it on their person,

stashing it nearby, or relying on the armed security of enforcers to protect them while they are selling drugs.^{58,59} Drug market conditions, however, are changing; drug-dealing groups rely less on on-street drug selling by youth.⁶⁰ These changes in the illegal drug market may be contributing to recent declines in juvenile arrests for drug and weapon offenses and accompanying reductions in firearm homicide victimization for young black males and arrests of juveniles for murder.

3. Social Networks and Youth Gun Carrying

A broad research literature consistently finds that peers, especially tight social networks, have a strong influence on adolescent behavior, particularly antisocial or delinquent behavior. A growing body of research also indicates that individuals at greatest risk for urban gun violence represent a small and select group that are tied to social networks of criminal offenders.³⁴ As indicated above, involvement with gangs facilitates access to firearms and promotes gun carrying among youth. But what are the important attitudes and social processes that promote gun carrying among gangs or crews who co-offend? In her extensive study of youth involved in guns and violence in and around New York City, Wilkinson found that, when asked why they carried guns, most reported that they needed to for self-protection and few said it was to gain social recognition or status among their peers. Yet many spoke of the need to let it be known that they were armed and willing to kill so as to deter others who might consider challenging, robbing, or disrespecting them.⁴³

Peer behaviors and perceptions of peer behaviors may be more powerful determinants of youth gun carrying than are the case for other risky behaviors. Not following the crowd who is using drugs, for example, only risks social exclusion. To many youth living in violent neighborhoods, not following peer norms on gun carrying could make a youth vulnerable to robbery and lethal attacks.⁴³ This feeling is likely to be particularly acute if someone close to a youth is shot. Hemenway and colleague's study of correlates of gun carrying among Boston high school students found that gun carriers appear to have a tendency to overstate the prevalence of gun carrying in their neighborhood even after controlling for factors such as actual levels of self-reported youth gun carrying in the neighborhood, gang membership, and prior victimization and

perpetration of violence. Because providing youth with more realistic information about over-estimated risky behavior has been an effective strategy for reducing risky behavior such as binge drinking, the researchers asked youth if they would be less likely to carry a gun if they found out fewer youth carry guns than they thought. Forty percent of those who reported carrying a gun said that such information would lead to them being less likely to carry guns.⁶¹

4. Fear-Driven Protection versus Violent and Criminal Motivations

Many youth report the need for self-protection as their main reason for acquiring and carrying guns.⁶² Many youth who carry guns are involved in activities and social networks and live in neighborhoods that put them at high risk for being shot and therefore feel the need to be armed with a gun. But the key risky behaviors that go along youth gun carrying – gang membership and drug selling – suggest an acceptance of risk and willingness to commit violence.

Molinar’s study of concealed gun carrying by youth in Chicago found strong support for gun carrying being determined, at least in part, by the risk of victimization. A multi-level study of individual and neighborhood factors found that having a family member who had been shot, personal victimization history, witnessing violence, and living in a neighborhood where it was unsafe for children to play were all strongly and independently associated with the odds that a youth was carrying a concealed gun.⁴² Yet these same measures of risk likely also reflect some measure of involvement in delinquent behaviors and social networks.

Two studies focus directly on the question of whether youth gun carrying is driven by risk taking, self-protection, or both. One study examines individual-level longitudinal data on thousands of Kentucky public school students in grades 7-9 at over a hundred schools to ascertain the temporal order of objective and perceived safety and at-school weapon carrying, including firearm carrying. Data from structural equation models find little evidence to support the “fear of victimization” hypothesis for students carrying weapons to school. Individual risk perception in 7th grade was actually negatively related to gun carrying in 8th grade. The frequency of gun carrying in 8th grade actually lead to lower levels of objective and perceived safety in 9th grade.⁶³ These results

support a “triggering” theory of violence; gun carrying, in this theory, is a stimulus to aggressive behavior and lifestyles that increase the risk of victimization as well as violent offending.

Several studies use the Mobile Youth Survey, a longitudinal survey of predominantly African American youth in Mobile, Alabama, to investigate the determinants of initiating gun carrying. Spano and Bolland assessed the relative strength of three hypotheses about youth gun carrying – diffusion, stepping stone, and cumulative risk. The diffusion hypothesis holds that gun carrying is a defensive reaction to past victimization and the threat of future violence. The stepping stone hypothesis posits that gun carrying is the outgrowth of aggressive and violent behaviors. The hypothesis supported best by the data was the cumulative risk hypothesis, which views gun carrying as the result of both victimization and perpetration of violence. A model that includes only exposure to violence or only a violent behavior variable fails to achieve statistical significance when predicting gun carrying among a sample of youth that had neither been exposed to violence nor had committed violent behavior at the outset of the study. The adjusted odds ratio for initiating gun carrying in this same sample, however, is 2.53 (95 CI: 1.36-4.71) for those youth who had both been exposed to violence and engaged in violent behavior.⁴⁰

III. Preventing Illegal Gun Acquisition and Carrying Among Youth

Given the ubiquity of guns in the United States and the multiple ways in which youth access firearms, keeping guns out of the hands of underage youth is particularly challenging. Yet there is growing evidence that there are policies, programs, and practices that reduce youth’s exposure to guns and thereby save lives.

A. Preventing Youth Access to Firearms in the Home

Failure to keep guns locked up securely leads to many suicides and unintentional shootings involving children and adolescents while also enabling criminals to steal guns that are later used to commit violent crimes. Keeping firearms locked up has been shown to lower the risk of unintentional and self-inflicted gunshot wounds to underage youth.²⁴

Laws requiring gun owners to store firearms locked and inaccessible to children have been shown to decrease suicides⁶⁴ and deaths due to accidental shootings.^{65,66}

A significant challenge to promoting safe gun storage, particularly to protect teens, is that gun owners often have unrealistic expectations of children's and adolescents' ability to always follow rules for safe handling and under-appreciate risks such as adolescent suicide.⁶⁷ Many gun owners feel that they can "gun proof" their children through education, yet controlled studies suggest that children and even teens cannot resist the lure of handling guns in unsafe ways when unsupervised.⁶⁸

Several educational approaches have been tried to promote safe gun storage in homes where there are children or adolescents. Some community campaigns to promote safe gun storage have had led to safer gun storage,^{69,70} and there has been evidence of shifting social norms toward safer gun storage.⁷¹ During the 1990s, an experimental trial found that pediatrician counseling to reduce gun availability to children by removing guns from the home or locking firearms away did not affect these behaviors.⁷² However, more recent attempts at healthcare providers promoting safe gun storage within the home have led to significant reductions in unlocked guns in the home.^{73,74}

The most cost-effective way to prevent many injuries involving consumer products is often to build safety into the product so that safety is not dependent on consistently sound judgment and careful behavior by those who come into contact with the product. Stephen Teret has promoted the idea of making guns "personalized." Personalized guns can only be fired by authorized users, thus preventing tragic deaths and injuries to unsupervised youth and making it impossible to fire the gun if it is stolen. There are low-tech ways to personalize guns using built-in combination locks and high-tech ways that rely upon technologies such as radio frequency identification that activates a gun only when it is within a few inches of a watch which the authorized gun user has previously activated with a personal identification number.⁷⁵

B. Preventing the Illegal Diversion of Guns to Youth

As discussed above, crime-involved youth typically acquire firearms from family, trusted friends, fellow gang members, and often ill-described "street" or "underground" sources. Preventing the transfer of firearms long after they have been diverted from the

legal to the illegal underground market appears to be a daunting challenge; however, no such effort has been attempted and evaluated. New York Police Department and Chicago Police Department have deployed undercover officers to attempt buy and bust operations that target individuals illegally selling guns to criminals. Although those efforts have not been evaluated, an in-depth study of participants in Chicago's underground gun market report that prospective purchasers of illegal firearms, often youth, are wary of buying guns from anyone but trusted suppliers, in part, due to concerns about being set up by an undercover law enforcement officer.¹³ Webster and colleagues study of juvenile offenders also found such concerns to be prevalent.⁸ As Cook and colleagues noted, such wariness adds "friction" in the underground gun market and thereby appears to constrain illegal gun acquisition.¹³

Preventing the initial diversion of firearms into the hands of prohibited persons and the underground gun market is likely to be easier to accomplish than preventing illegal transactions after diversion. Webster and Wintemute present an extensive review of the research on policies and practices to keep firearms from high-risk individuals including youth.⁷⁶ Although there are several examples of policies that prohibit firearm purchaser or possession by specific categories of high-risk individuals leading to lower levels of violence (e.g., persons under restraining orders for domestic violence, violent misdemeanants), the limited research that has examined the effects of laws that restrict firearms based on the youthful age of the purchaser or possessor have not found significant effects.

Marvel examined the effects of state laws that prohibited juveniles (ages < 18 years-old) from possessing handguns on juveniles' involvement in homicides as victims and arrestees during 1970-1999. These prohibitions were unrelated to juvenile involvement in homicides in regression analyses of state-level annual data. Many of the laws under study were adopted during the early 1990s when juvenile homicide rates were peaking after dramatic increases in the late 1980s and just before juvenile homicides dropped sharply from 1994 to 1999. These dramatic changes were driven by unmeasured forces (e.g., drug markets, gang activity, changes in social norms) that were uneven across the 50 states.⁷⁷ Marvel's state-specific linear terms to control for unmeasured very nonlinear changes were likely to be inadequate to avoid biases. It is also worth noting that

the laws Marvel evaluated may have minimally affected juveniles' risk of legal consequence if they possessed handguns. Prior to such prohibitions, juveniles could be charged with possessing a gun outside the home without a permit to carry a concealed firearm.

Rosengart and colleagues estimated the impact of state laws that set 21 years as the minimum age for legal purchase and possession of handguns during 1979-1998. None of these laws were significantly associated with firearm homicides and suicides. The authors note that the null findings may be due to there being only three purchase laws and one possession law with five or more years of post-law data, thus limiting statistical power. Further, the models used to estimate the laws' effects assumed immediate and full effects upon enactment and more gradual effects may occur with supply-oriented gun laws.⁷⁸ We are aware of no research that evaluates the impact of temporary firearm prohibitions for young adults who had been found by juvenile courts to have committed serious crimes.

The studies of youth-focused gun laws mentioned above did not consider whether the impact of youth firearm restrictions depended on the presence of complementary laws designed to prevent the diversion of guns to prohibited persons. There are, however, several studies showing that certain firearm policies prevent the diversion of guns to criminals. These studies have used crime gun trace data from the ATF to examine the relationship between state firearm sales policies and indicators of illegal diversion. The most common indicator is an usually short interval between retail sale and crime (known as short time-to-crime or TTC) involving a criminal possessor who is not the purchaser of record or gun recovery in crime in a state other than the one in which the gun was originally sold.

In a study using data from 54 major cities, Webster and colleagues found that state laws regulating private transfers of handguns (typically known as comprehensive background checks or CBC), the most rigorous forms of permit-to-purchase (PTP) licensing for handguns, and strong regulation and oversight of licensed gun dealers were independently associated with lower levels of gun diversions after controlling for other factors.⁷⁹ Pierce, Braga and Wintemute examined data from crime gun traces of guns recovered by police during the period 2003-2006 across all 50 states to assess whether

PTP laws, handgun registration, and California's comprehensive gun laws affected the diversion of guns to criminals.[†] Focusing their analyses on cases in which crime guns were recovered from persons other than the purchaser of record, survival analyses indicated strong protective effects against diversion for having PTP laws, registration laws, and the strongest effect for California's laws.⁸⁰ Undercover stings and lawsuits against gun dealers who facilitate illegal straw gun sales have also been shown to prevent the diversion of guns to criminals.^{81,82}

Studies that examine the relationship between state gun laws and the flow of guns from one state to another can be particularly instructive for understanding the ability of gun sales laws to prevent diversion and firearm access among high risk groups. When state laws that are associated with the importation of crime guns from other states it suggests that guns in the underground gun market are relatively scarce as a result of local laws blocking the diversion of guns to criminals. Indeed, states with the most comprehensive firearm sales regulations had a much smaller share of their crime guns originate with in-state sales than did other states and that measure was inversely correlated with gun availability to criminals.^{83,84} Laws most strongly associated with preventing the export of crime guns were laws requiring gun owners to promptly report lost or stolen firearms to police, local discretion to adopt gun laws stronger than those adopted by the state, prohibition of straw purchases, strong PTP, and comprehensive background checks.^{85,86}

Recent studies have found a negative association between stronger background check requirements such as PTP systems, strong gun dealer regulations, and firearm homicide rates.^{87,88} These studies are limited by cross-sectional designs or limited variation in the most robust laws such as PTP law requiring in-person application and strong gun dealer regulations.⁸⁵ Ludwig and Cook estimated the effects of the Brady Law requiring background checks for firearm sales conducted by licensed firearms dealers and found no significant impact on homicide victimization or suicide for any age group. More recently, researchers found that states expanding the number of types of

[†] California's set of gun sales laws and procedures that among the most rigorous in the nation for preventing gun diversions including comprehensive background checks, purchaser thumb print identification verification, registration, 1-gun-per-customer-per-month restrictions, high standards for legal gun ownership, and strong regulation and oversight of licensed firearms retailers.

prohibitions identified in their background checks for gun sales reduced homicides at a greater rate.⁸⁹

Perhaps the most direct and power evidence of the protective effect of comprehensive background checks for handgun sales and PTP policies comes from a study of the effects of Missouri repealing those laws in August 2007. Immediately following the repeal of this law, diversions of guns to criminals indicated by very short TTC guns increased two-fold and the share of guns used by criminals that had originated with a sale by a Missouri gun dealer (Webster et al., 2013). More importantly, an analysis of changes in homicide and murder rates for the period 1999-2012 found that the repeal of Missouri's law was associated with a 25% increase in firearm homicide rates during the first 3.3 years the law was in effect, no effect on nonfirearm homicides during that period, and a 14% decline in murder rates over 5.3 years.⁹⁰ Through statistical controls or stratifications, the researchers ruled out many explanations for the sharp increase in lethal violence including changes in economic conditions, policing levels, incarceration, other public policies, regional trends, or conditions specific to major counties. While the published research did not examine the effects specific to age groups such as youth, we found that firearm homicide victimization rates for youth ages 15-24 years in Missouri increased 12.9 percentage points (20.67 to 23.33) from 1999-2007 to 2008-2012 when rates for this age group were declining by 12.9% nationally (18.46 to 16.08) and states with the largest population that bordered Missouri were also seeing significant decreases (-7% in Illinois, -14% in Kansas, -23% in Arkansas, -10% in Tennessee).

C. Reducing Illegal Carrying of Firearms by Youth

Gun violence in many cities is very concentrated in space, time, and among people. When gun violence involving youth was surging in many U.S. cities during the early 1990s, many police departments deployed special units to focus principally on detecting and deterring illegal gun carrying when and where the risks of shootings were greatest. Kansas City, Missouri deployed a unit of officers in a neighborhood with high levels of gun violence for 29 weeks in 1992. The unit received special training and instructions for identifying individuals illegally carrying concealed firearms. Their tactics included enforcement of laws against minor crimes and so-called *Terry* pat downs of

suspects for weapons for officer safety. Gun unit officers also conducted door-to-door visits to the community to let them know of their activities and to encourage calls to a police department tip line if they observed someone illegally carrying a firearm. During a 29 week intervention period, shootings decreased by 44% in response to the gun unit deployment in the target area while there was no change in the comparison area or in adjacent neighborhoods.⁹¹ Surveys of community members revealed broad support for the gun unit's activities and reduced fear of crime.⁹²

Indianapolis tested two approaches to gun carrying suppression in separate high-crime neighborhoods. Both intervention areas focused special police units in high-risk locations and times on illegal gun possession and included meetings with community members. In East Indianapolis, the special gun unit focused on vehicle stops. In North Indianapolis, officers focused on individuals on parole or probation or individuals suspected of involvement in violent crime. The intervention period was limited to 90 days in 1996. Interrupted time-series analyses indicated a non-significant increase in gun crimes (0.5 per week) in the East intervention area and a statistically significant increase in the comparison area that was three times greater than then intervention site (1.5 gun crimes per week), suggesting a protective effect of the gun patrols. The intervention in the North, with its greater focus on high-risk offenders, was associated with a statistically significant decline of nearly 2 gun crimes per week in the North intervention and no change in the comparison area.⁹³

Pittsburgh Police Department deployed gun carrying suppression units in a high-crime area during a 14 week period in 1998. Using a difference-in-difference-in-difference (DDD) estimation approach contrasting intervention days versus non-intervention days in the intervention area compared with the differences between the same days in the comparison area, the intervention was associated with a 34% reduction in shots fired and 71% reduction in victims wounded by gunfire. When the gun unit was discontinued due to funding constraints, gun violence levels returned to pre-intervention levels.⁹⁴

In 2007, Baltimore began deploying special police detective units to hot spots for gun violence to conduct surveillance on offenders in those areas with a history of gun-related crime and to deter illegal gun carrying generally. While the studies cited above

examined short term effects of short-term interventions, the gun violence suppression units deployed in Baltimore were in place for more than four years. Researchers contrasted changes in gun violence in the targeted hot spots with changes experienced in other high-crime areas after controlling for other factors and estimated a 27% reduction in homicides and a 15% reduction in nonfatal shootings associated with the intervention.⁹⁵

An important limitation of the research cited above is that none of the studies specifically examined the effects of the intervention on youth offending or victimization, thus living in question whether the findings generalize to youth. One study of gun carrying among youth subsequently incarcerated found that special police patrols that focused on illegal gun carrying were the most common reason cited for not carrying guns.⁵⁹ More research is needed on if and how police illegal gun suppression efforts affect youth carrying concealed firearms.

Although there is a consistent record of success in reducing gun violence, tactics used in illegal gun suppression policing can be used in ways that are, in some cases, illegal or otherwise harmful to “suspects” if they are harassed or abused.⁹⁶ The potential for these negative outcomes are magnified when there are large, department-wide edicts to “stop and frisk” with minimal training and oversight of officers or communication with communities. In Kansas City and Indianapolis, police made special efforts to communicate what they were doing with their illegal gun suppression efforts and get the community’s buy-in. Officer training in those cities emphasized the importance of legal searches and respectful and professional interactions with citizens. In each case, community surveys indicated broad support for the program, though it should be noted that the programs only lasted a few months. Police risk losing community support for illegal gun suppression if they are overly aggressive, only increase arrests for minor crimes, or conduct unwarranted stop and frisks.

D. Focused Deterrence of Gun Violence

Beginning with Boston’s Operation Ceasefire in 1997, David Kennedy has led the development, implementation, and refinement of a strategy to reduce violent crime known broadly as focused deterrence. As was the case with Boston’s Operation

Ceasefire, focused deterrence has most commonly been applied to the problem of gun violence involving gangs or other networks of mostly young offenders. The process begins with an in-depth analysis of data collected by police and other criminal justice agencies to identify individuals and groups involved in a significant portion of incidents of gun violence in defined hot spots for violence. These high-risk offenders are called in as groups or individually and told by law enforcement leaders that all “levers” of the criminal justice system are poised to respond with significant sanctions if the individual or, in some cases, anyone in their group is caught illegally possessing or using firearms. Victims, community leaders, faith leaders, or other civilians respected by the offender(s) participate in these meetings along with law enforcement to communicate to the offenders how their behavior is harming others and that they must stop. Services to facilitate transitions to legal, safer lifestyles are offered. Although many offenders targeted directly with this program are 25 years-old or older, they are often connected to and have some control over youth who are part of their gang, crew, or clique.

Braga and Weisburd completed a recent systematic review of evaluations of focused deterrence interventions and identified five that focused on gang/group violence and two that focused on individual high-risk offenders.⁹⁷ Gang or group focused interventions had a relatively large protective effect on measures of gun violence (standardized difference in mean between intervention and comparison, Cohen’s $d = .770$, $p < .05$). Interventions that only focused on high-risk individuals and not groups, had less impact on community violence than did group-focused interventions ($d = .186$, $p < .05$), but more impressive effects on deterrence of individual-level recidivism ($d = .471$, $p < .05$).

Evaluations of these interventions typically have not examined whether the beneficial effects are specific to youth-involved shootings. The exception was the evaluation of Boston’s Operation Ceasefire focused deterrence intervention when documented a 63% reduction in youth-involved homicides.⁹⁸ Although the study was not designed to study the effects of focused deterrence or policing efforts directed at discouraging illegal gun use, ethnographic research of Chicago’s underground gun market found that gang leaders rationed access to guns among their members out of concern that illegal gun possession and violence would bring unwanted attention by law

enforcement, threatening both their profits from the illegal drug trade and their ability to avoid incarceration.¹³

IV. Summary

Youths' access to firearms, particularly if unsupervised or in the context of illegal activities, increases the risk of homicides, suicides, and deaths from unintentional shootings. There is an abundance of guns in U.S. homes, motor vehicles, and on the streets, as well as willingness of tight networks of young offenders' willingness to loan or share guns. In most instances, youth acquire guns from friends, family members, or underground market sources in which they have some level of trust.

Although there are significant challenges to reducing high-risk access to guns by youth, a number of interventions have been found to lower risk for high-risk access and/or use of firearms by youth and others. Safe storage of firearms – keeping them locked up and unloaded – lowers the risk of unintentional shootings and suicides involving youth and should be promoted by physicians. Child access prevention (CAP) laws have saved children and adolescents' lives. Yet no state has enacted a CAP law since 1998.

Several laws that provide law enforcement with tools to hold firearm sellers accountable if they illegally transfer firearms to prohibited individuals appear to prevent the diversion of guns to criminals, including youthful offenders. These laws include comprehensive background check requirements, permit-to-purchase (PTP) requirements for handguns, mandatory reporting of lost or stolen firearms, and strong regulation and oversight of licensed gun dealers. In the case of universal background checks with PTP, there is evidence of protection against homicides involving youth.

Adolescents commonly report that they carry guns for reasons of self-protection; but teens' carrying concealed handguns is most typical in the context of other delinquent, risky, and antisocial behaviors. Specialized illegal gun suppression police units deployed to hot spots for shootings reduce gun violence, but carry the potential for harassment, especially if oversight and accountability measures are lacking. Focused deterrence directed at gang violence has an impressive track record of reducing gun violence and subjects fewer innocents to unwanted police attention than is the case with gun carrying

suppression efforts focused on high-risk places. Given a growing body of evidence on the harmful effects of incarceration of youth,^{99,100} these interventions should place deterrence and the prevention of gun violence as the primary foci.

Broader application of the evidence-based strategies discussed above should significantly reduce gun violence involving youth; yet there remain significant gaps in existing research that could enhance future prevention efforts. We have a general understanding of how youth access handguns, but there is a dearth of data on what factors deter youth gun acquisition. How elastic is the demand for illegal handguns among youth and what factors modify that elasticity? If there is a tendency for teens to overestimate gun carrying among their peers, would providing more accurate information to adolescents on the relatively rarity of gun carrying among their peers lead to reductions in youth gun carrying? Street outreach workers and violence interrupters have generally focused on discouraging youth from using guns to resolve disputes.^{101, 102} How effective could these credible messengers be in discouraging illegal gun acquisition among high-risk youth, at least under circumstances in which emotions are high? Focused deterrence has focused principally on illegal gun possession among high-risk individuals and groups. Could the same principals be applied to reduce illegal transfers of guns to youth?

Youth access to firearms in the home declined dramatically from the mid- to late-1990s and more gradually for another decade. Some data suggest that gun ownership is increasing in recent years. What effect will this have on youth access to firearms and their risk of being killed with a firearm? Most child access prevention laws are at least 20 years old and rely mostly upon public awareness, social norms, and general willingness to obey laws. How aware are gun owners of these laws today and what is their compliance with the laws? What messages and messengers are most effective in promoting safe gun storage to prevent unsupervised access to firearms by youth?

Unsupervised access to firearms by underage youth will remain as an important threat to youth in the U.S. for years to come. How well and how broadly evidence-based strategies are applied to the problem, our ability to answer the questions raised above and use the data will have great bearing on a leading cause of death and serious injury to youth.

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