

**GUNS AND MORTALITY AMONG
AMERICAN YOUTH**

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GUNS AND MORTALITY AMONG AMERICAN YOUTH

EXECUTIVE SUMMARY

Approximately fifty thousand American children died of gunshot wounds in the ten-year span from 1988 through 1997. This report establishes an important fact about these fatalities: many of the deaths were the direct consequence of the widespread access to guns. The significant findings in support of this observation include:

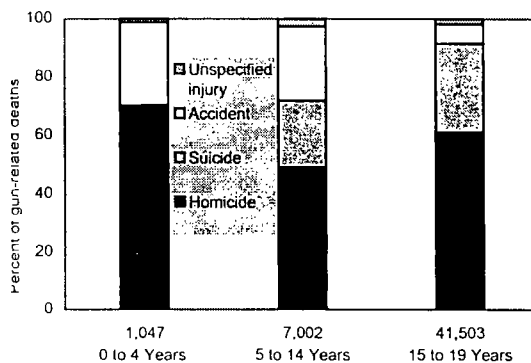
- ***Gun access was responsible for approximately 5,000 unintentional deaths.*** About 10 percent of the 50,000 gun-related deaths from 1988 through 1997 were unintentional—deaths that would clearly not have occurred if the guns were not present. Data indicate an approximately one-to-one correspondence in the rates of gun ownership across states and the incidence of unintentional gunshot deaths. Thus, children living in states with high rates of gun ownership were far more likely to die from unintentional gunshot injury than were those living in states with low rates of gun ownership.
- ***State-level data indicate a strong link between guns and suicidal deaths among young people; higher levels of gun access lead to higher levels of suicide.*** From 1988 through 1997 there were 1,588 gun-related suicides among children aged 5-14 and 12,563 among teens aged 15-19. Because guns are an especially lethal means of suicide, suicide attempts are more likely to result in death when guns are involved. Thus, in states where gun ownership is common, suicide among young people is also more common. Among young people (aged 19 and younger) the *gun-related suicide rate* was 2 to 3 times higher in the 10 states with the highest rates of gun ownership than in the 10 states with the lowest rates of gun ownership. And although these same states had slightly lower rates of *non-gun suicide* than states with low levels of gun ownership, the *overall suicide rate* was much higher in the states with high levels of gun ownership.
- ***The apparent proliferation of guns from 1985 through 1993 played a key role in the very large increase in accidental and suicidal deaths among African American teens.*** From 1985 through 1993 there appears to have been a sharp rise in gun possession among African American teens. This proliferation of guns resulted in a corresponding increase in both unintentional gun injury deaths and gun-related suicide—which more than doubled for African American teens (aged 15-19) over this time span. Teen gun possession appears to have declined since 1993; both unintentional gun fatalities and gun suicides have dropped.
- ***There were 30,000 gun homicides over the decade. Many of these deaths were the direct consequence of high levels of gun access.*** Although hundreds of the very young children, aged 5 and younger, were victims of gun homicides, gun access does not appear to be a key determinant of homicides among this particularly defenseless group. However, among children aged 5-14, and especially among teens aged 15-19, homicide deaths and guns are strongly linked. Two pieces of evidence support this contention—one focusing on youth generally, the other on African American youth. First, *gun homicide* is more common among children in states in which households have higher rates of gun ownership. In contrast, these same states with high rates of gun ownership do not generally have high rates of *non-gun homicide* for older children. Second, the rapid increase in gun possession by African American teens from 1985 through 1993 was associated with a large increase in *gun homicide* among African American teens (aged 15-19) while *non-gun homicides* were little changed.

GUNS AND MORTALITY AMONG AMERICAN YOUTH

1. INTRODUCTION

Guns exact a devastating toll on youth in the United States. Approximately 50,000 children died of gunshot wounds in the ten-year span from 1988 to 1997. This report establishes an important fact about these fatalities—that many of the deaths were the direct consequence of our nation's widespread access to guns. The report presents compelling evidence that gun access was responsible for a large number of fatalities among America's children—from unintentional gunshot injuries, suicidal deaths, and homicide. (Chart 1 shows a breakdown of gun deaths for 3 age groups.)

Chart 1. Composition of Gun Fatalities by Age



The report has four main sections. First is an analysis of fatalities from unintentional gunshot injuries using state-level data. About 10 percent of the recorded gunshot deaths to youth from 1988 to 1997 were unintentional—deaths that clearly would not have occurred in the absence of gun access. Examination of data on unintentional gun fatalities across states produces an entirely expected pattern: in states where more households have guns there are also more unintentional gun fatalities among children.

Second, the report examines the complicated issue of the incidence of youth suicide and access to guns. Mental health experts emphasize that there are many facets to youth suicide—including a central role of depression and other mental disorders as risk factors. The focus here is on the role of guns, as the majority of youth suicides (over 14,000 suicides among those aged 19 and younger) were gun-related. State-level data provide compelling evidence that gun access increases suicide among youth; in states where gun ownership is common, gun suicide among young people is also more common. Moreover, the *overall* suicide rate for young people is higher in the states with high levels of gun ownership.

The third section of the report examines trends over the last two decades in gun-related unintentional deaths and suicides focusing specifically on African American youth. There is evidence that in the mid-1980s there was a proliferation of guns in hands of teens in many American cities. The increase in gun possession, from 1985 through 1993, was responsible for a sharp rise in accidental deaths, and was associated with an increase in gun-related suicides for African American teens. There has been a pronounced downturn in these rates since 1993.

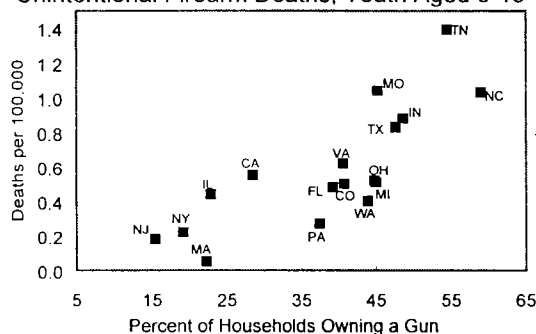
Finally, the report discusses the 30,000 gun homicide deaths that occurred among young people during the ten-year sample period. Among the youngest and most defenseless of children (aged 0-4), gun possession appears to play only a limited role, as homicides of the very young are generally committed using means other than guns. Among older children (aged 5-14) there is evidence that guns played a larger role. However, the most important evidence about the role of guns is for older teens (aged 15-19). The rates of homicide among this group are very high, especially among African Americans. Analysis that tracks homicide rates for African American teens shows a very similar pattern as for unintentional deaths caused by guns and suicides using guns—a sharp increase in gun homicides from 1985 through 1993 followed by a marked decline. There appears to be a strong role of gun possession in explaining this trend.

2. UNINTENTIONAL GUNS DEATHS—AN ANALYSIS ACROSS STATES

In the approximately 4,900 unintentional child deaths from gunshot wounds during the sample period, the role of gun availability was most obvious; these fatalities would not have occurred were it not for the presence of a gun.

One would expect unintentional gun deaths among children to be most common in states where gun ownership is also most common. To examine this hypothesis we turn to state-level data on gun-related mortality. This data comes from the Centers for Disease Control (CDC) and Prevention. Because no nationally representative data on gun ownership exists, reliable comparison of gun ownership across all states is difficult. We use two data sources in our analysis to provide evidence about gun possession rates across states. First, there are data from the General Social Survey (GSS) for the period 1990-1998, which provides statistics on household gun ownership for 17 states.¹ Second, following the research of Philip Cook, an economist at Duke University, we construct a rough index of gun ownership for all states by averaging the rates at which adult homicides and suicides are committed with a gun.² The results of this statistical exercise are presented in the Appendix. This "Adult Gun Index" suggests that guns are most prevalent in southern states and are least prevalent in Hawaii and several northern states. Among the 17 states for which data are available, the Adult Gun Index and the GSS measure of gun ownership are highly correlated (a Pearson's correlation coefficient of 0.81).

Chart 2. State Gun Ownership Rates & Unintentional Firearm Deaths, Youth Aged 0-19



Examination of unintentional gunshot deaths using these state-level data shows a distinct pattern: States with higher gun ownership rates have more unintentional gun deaths to children of all ages. Chart 2 shows, for example, the relationship between rates of unintentional gun deaths for youth aged 19 and younger and the GSS measures of gun ownership (for the 17 states for which data are available). There is an approximately one-to-one relationship between gun ownership and unintentional gun deaths, i.e., a one percent

increase in household gun ownership corresponds to an approximately one percent increase in accidental gun deaths among young people³.

A similar inference is drawn using the Adult Gun Index as a measure of gun possession. There is a high correlation between accidental gun deaths and this measure. The correlation coefficients between the index and the state-level rates of accidental gun mortality are 0.69 for

¹ Our analysis uses statistics on gun ownership based on data derived from the General Social Survey and reported in T. Smith and L. Martos, "Attitudes Towards and Experiences With Guns: A State-level Perspective," National Opinion Research Center, December 1999. These statistics indicate that fewer than 1 in 5 households in New York and Massachusetts own guns, for example, compared with more than half of households in Indiana and North Carolina.

² Our analysis follows the methodology of Phillip Cook's "The effect of gun availability on robbery and robber murder: a cross-sectional study of 50 cities," Policy Studies Review Annual 1979, 3:743-781.

³ An ordinary least squares regression of the log of the gun-related accidental deaths (among 15- to 19-year-olds) on the log of the GSS measure of gun availability resulted in a coefficient of 1.02 with a p-value of .012. The GSS data cover 1990-98, and the CDC data cover 1988-97. Similar results were found using gun-related accidental deaths for the other youth age groups used in this paper.

mortality among 0- to 4-year-olds, 0.70 for 5- to 14-year-olds, and 0.71 for 15- to 19-year-olds.⁴ Table 1 provides another way of looking at these data. This table shows the average mortality rate for the 10 states with the highest levels of gun ownership—as calculated by the Adult Gun Index—and for the 10 states with the lowest levels of gun ownership. Deaths from unintentional gunshot injury in states with the highest gun ownership are 4½ to 6 times as high in the states with the lowest rates of gun ownership.⁵

Table 1. Unintentional Firearm Deaths Among Children and Youth, 1988-1997

	Rates of Unintentional Firearm Deaths (per 100,000 in Age Group)		
	10 States with Highest Gun Possession	10 States with Lowest Gun Possession	Ratio of Rates in High-Gun to Low- Gun States
Children Aged 0-4	0.32	0.05	5.95
Children Aged 5-14	0.96	0.16	6.0
Youth Aged 15-19	2.97	0.65	4.6

The role of guns in unintentional deaths is clear; these are deaths that would not have occurred if the guns had not been present. The state-level analysis confirms an expected outcome—that unintentional deaths are more likely when there are more guns in households. The analysis is useful for yet another reason. One would certainly expect that states with more guns also have more unintentional deaths from gunshot wounds. The fact such a relationship holds—and that the relationship is strong—provides increased confidence in both the GSS gun ownership data and the Adult Gun Index as reasonably good state-level measures of gun access.

3. GUN SUICIDES—AN ANALYSIS ACROSS STATES

The role of guns in youth's deaths from suicide is a more complicated issue than with unintentional gun-related deaths. Studies indicate that depression, hopelessness, and substance abuse are major risk factors for teenage suicide. Stressful life events, such as legal or disciplinary problems, and unstable relationships with family, friends, and significant others, may also precipitate a suicide attempt in youths. Tendencies towards impulsive behavior, e.g. responding violently to crises that could be resolved with guidance, also place youths at risk. Among young people suicidal ideation and suicide plans are far more common than suicide attempts. Most suicide attempts by youths do not result in death; estimates of the ratio of nonfatal attempts to completed suicides among young people range from 12 to 1 to as high as 37 to 1.⁶

Gun availability appears to play a role in making suicide attempts more lethal. Youth suicide attempts are often impulsive, and gun suicides are overwhelmingly lethal compared to other means. The presence of a gun, together with this impulsive behavior, then poses a

⁴ These coefficients are statistically significant at the 0.01 level.

⁵ We are indebted to David Hemenway (Harvard School of Public Health) and his colleagues who gave invaluable input at several stages of the analysis. In particular, they suggested using the Gun Index to rank states and compare mortality ratios along this dimension.

⁶ Studies conducted in Oregon ("Fatal and Nonfatal Suicide Attempts Among Adolescents – Oregon, 1988-1993", MMWR, CDC, April 28, 1995) and Colorado ("Suicide Prevention and Intervention Plan," Governor's Suicide Prevention Advisory Commission, November 1998) reported numbers that ranged from 12:1 to up to 37:1 (for Oregon youths aged 10-14).

significant risk factor for many young people.⁷ Consequently, in states where young people have greater access to guns in their homes, one would expect that there would tend to be more *gun-related* suicides and more *total suicides*.

Chart 3. State Gun Ownership Rates & Non-Gun Suicides, Youth Aged 15-19

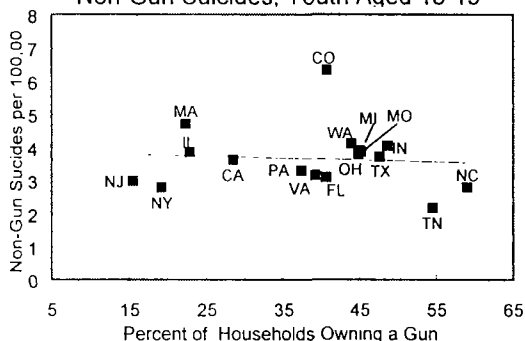


Chart 4. State Gun Ownership Rates & Gun Suicides, Youth Aged 15-19

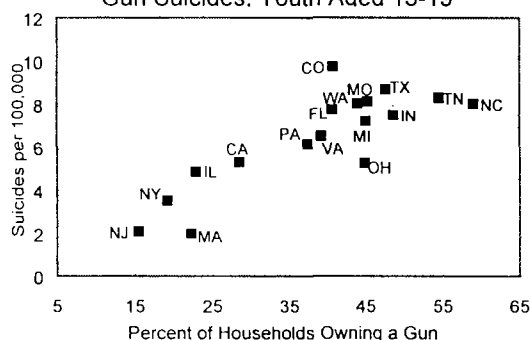
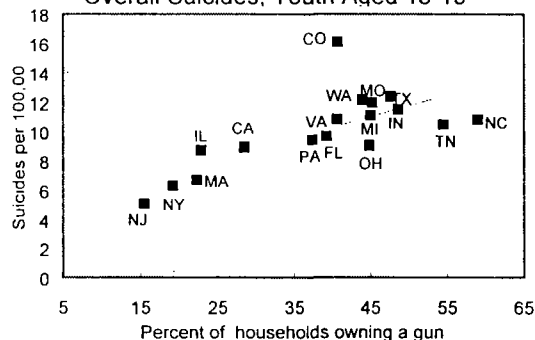


Chart 5. State Gun Ownership Rates & Overall Suicides, Youth Aged 15-19



Charts 3, 4, and 5 plot state-level teen suicide rates (for 15- to 19-year-olds) and household gun ownership rates (from the GSS data) for non-gun suicides, gun suicides and overall suicides. The rates of *non-gun* suicide are not systematically related to gun ownership (Chart 3). In sharp contrast, rates of *gun* suicide are generally higher in states where there are higher levels of gun ownership. And as a consequence the *overall* suicide rate is higher for in states where greater proportions of households have guns. A similar relationship holds for suicides among younger children. These results are consistent with the hypothesis that the presence of guns in households leads to greater suicide fatality among young people.

Use of the Adult Gun Index allows us to draw the same inference. There is a statistically significant positive correlation between the Adult Gun Index and both gun suicides and overall suicides for 5- to 14-year-olds and 15- to 19-year olds.⁸ Table 2 provides a comparison in the rates of suicide for the 10 states with the highest levels of gun availability (according to the Adult Gun Index) and the 10 states with the lowest levels of gun availability. Among youth aged 5 to 14, in the 10 high-gun states, the *gun* suicide rate was 3 times higher than in the 10 states with the lowest levels of gun availability. While the rate of *non-gun* suicide was no higher in the high-gun states, the relatively high incidence of *gun* suicides caused the *overall* suicide rate to be about 70 percent higher in the high-gun states. Similarly, among 15- to 19-year-olds, the *gun* suicide rate was more than

⁷ In one study of patients treated for self-inflicted gunshot wounds (not restricted to youth), only one-third of the group was diagnosed with "a major depressive episode" and none showed indication of a suicide plan. About half of the patients had used alcohol before the incident, and a slightly larger number reported interpersonal conflict before attempting self-injury. The combination of alcohol, stressful events, and impulsiveness is extremely dangerous when a gun is present. (See L.G. Peterson et al., "Self-Inflicted Gunshot Wounds: Lethality of Method versus intent," *American Journal of Psychiatry*, February 1985. C.R. Pfeffer et al., "Suicidal Children Grow up: Ego Functions Associated with Suicide Attempts," *Journal of American Academy of Adolescent Psychiatry*, October 1995.)

⁸ The correlation coefficients between the Adult Gun Index and suicide rates are: 0.53 for gun suicides of 5- to 14-year olds, 0.59 for gun suicides of 15- to 19-year-olds, 0.34 for all suicides for 5- to 14-year-olds, and 0.38 also for overall suicides for 15- to 19-year-olds. All of these coefficients are statistically significant at the 0.01 level.

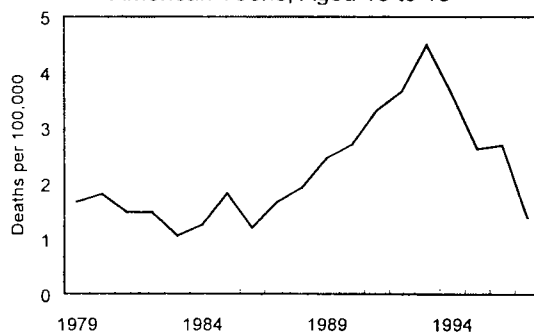
twice as high as is the states with the lowest levels of gun availability. Finally, the *overall* teen suicide rate was 50 percent higher in the high-gun states.

Table 2. Suicide Among Children and Youth, 1988-1997

	Rates of Suicide (per 100,000 in Age Group)		
	10 States with Highest Gun Possession	10 States with Lowest Gun Possession	Ratio of Rates in High-Gun to Low- Gun States
Children Aged 5-14			
Gun Suicides	0.58	0.19	3.2
Non-Gun Suicides	0.30	0.33	0.9
All Suicides	0.88	0.52	1.7
Youth Aged 15-19			
Gun Suicides	8.65	4.00	2.2
Non-Gun Suicides	2.59	3.83	0.7
All Suicides	11.23	7.83	1.5

4. AN EXAMINATION OF RECENT TRENDS IN GUN SUICIDES AND UNINTENTIONAL DEATHS OF AFRICAN AMERICAN TEENS.

Chart 6. Firearm Accident Rates for African American Teens, Aged 15 to 19



The general conclusions from the state-level analyses of both unintentional gun deaths and suicides are clear: higher levels of gun access are associated with greater youth mortality. In this section, complementary analysis is presented that examines dramatic trends in gun deaths among African American teens over the past two decades. As Chart 6 shows, from 1985 through 1993 there was a sharp rise in the rates of deaths from unintentional gunshot injuries. After 1993, there was a marked decline in these unintentional gun deaths. There was no similar dramatic trend

among whites, so it important to examine possible explanations focusing on African American youth specifically.

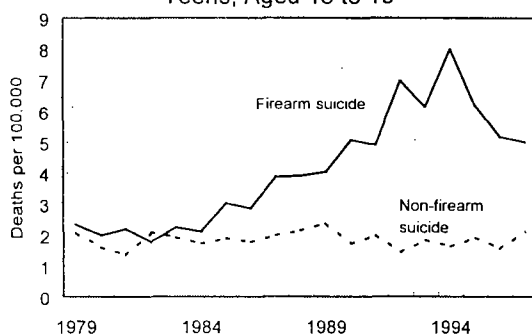
The analysis in Section 2 of this paper suggested that there is an approximately one-to-one relationship between gun possession and unintentional gun deaths⁹. The trends in Chart 6 therefore suggest that beginning in 1985 there was a rapid dissemination of guns among African American teens and that this trend abated after 1993. Although reliable direct statistics on teen gun possession are not available, there is independent evidence consistent with this hypothesized trend in teen gun possession. From 1985 through 1993, juvenile arrest rates for weapons law violations more than doubled. Then in 1993 arrest rates for weapons violations declined.¹⁰

⁹ See footnote 3 above.

¹⁰ The patterns of juvenile weapons violation arrest rates were plausibly caused by one of two factors: an increase in police effort targeting youth who carry guns (from 1983 through 1993) followed by a decline in such police efforts (after 1993), or a dissemination of guns among youth which abated by around 1993. The evidence in Chart 6 is consistent with this later explanation. Also, there is little evidence of decreased police vigilance in the early 1990s.

Recent research links the dissemination of guns into the hands of American teenagers in the mid- to late-1980s with the advent and growth of the crack cocaine trade.¹¹ Crack cocaine first arrived in large cities like Miami, Los Angeles, and New York in about 1983. After remaining fairly constant from 1975 through 1984, drug arrest rates among non-white juveniles more than doubled from 1985 to 1989. Researchers suggest that guns were carried by teens directly involved in drug markets, but possession became far broader as other teens acquired guns in reaction to this trend—for perceived self-protection or as a status symbol.¹² It appears that gun possession is lower among the current cohorts of youths than among their immediate predecessors. This drop in gun possession, after 1993, has been linked to a number of factors:¹³ systematic changes in the drug markets (with a decline in the number of new crack users and some stabilization of these illegal markets), an economic expansion which created new opportunities for young people who might otherwise have been drawn into criminal activity, and efforts to limit opportunities of high-risk individuals from purchasing guns (exemplified by the 1994 Brady Bill) which may have been effective in limiting the supply of guns to young people.

Chart 7. Suicide Rates for African American Teens, Aged 15 to 19



Whatever the causes of the trends in gun possession, evidence shows that this gun access is closely linked to gun-related suicides. Chart 7 shows that gun suicides among African American youth increased rapidly after the mid-1980s, peaked in 1994, and declined markedly thereafter. Over this same period there was virtually no change to *non-gun* suicide. As with the cross-state analysis, the evidence from recent patterns for African American teens is consistent with gun possession having a direct effect on the prevalence of suicide.

5. GUN HOMICIDES

The largest component of gun-related deaths among American youth is mortality due to gun homicide. This section of our analysis provides evidence that as with suicides and unintentional deaths, gun availability plays a key role in deaths from homicide. We begin our analysis by continuing the focus on trends in homicide deaths among African American teens. This group is particularly important to study because African American teens are at far higher risk of being homicide victims than are other young people.¹⁴

Chart 8 shows that, as with trends in gun suicides and unintentional gun deaths, there was a rapid increase in the rate at which African American youth were victims of gun homicides from 1985 through about 1993, and a decline following 1993. As indicated in Chart 9, statistics from

¹¹ The hypothesis discussed in this paragraph and the next draw primarily from Alfred Blumstein and Daniel Cork, "Linking Gun Availability to Youth Gun Violence," *Law and Contemporary Problems*, Winter 1996.

¹² Blumstein and Cork cite a 1993 study conducted in center-city schools in which 22 percent of students possessed guns, with 68 percent citing protection as the main reason.

¹³ See Alfred Blumstein, Frederick Rivara and Richard Rosenfeld, "The Rise and Decline of Homicide—and Why," *Annual Review of Public Health*, 2000.

¹⁴ The majority of youth gun fatalities generally are to whites. However, about 6 in 10 *homicide* gun fatalities to youth (from 1988 through 1997) were African American.

the Bureau of Justice Statistics on homicides committed by young people (data are provided for individuals aged 14 to 17) follow a nearly identical pattern.

Chart 8. Homicide Rates for African American Teens, Aged 15 to 19

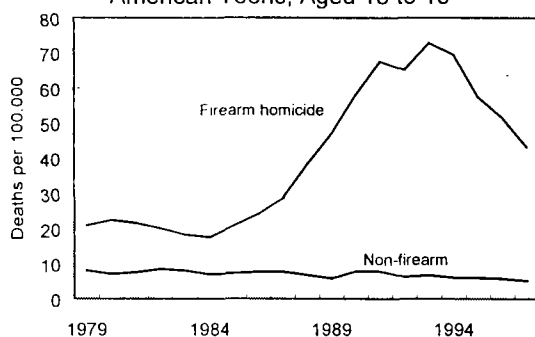
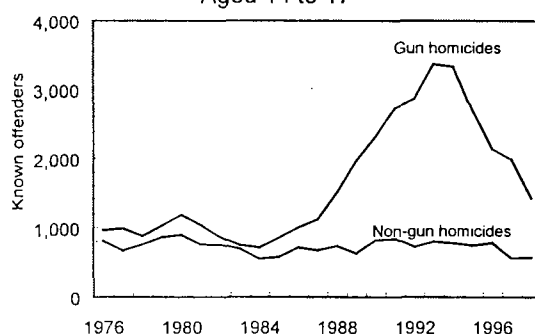


Chart 9. Homicides Committed by Youths, Aged 14 to 17



In principle, two competing explanations could account for the sharp rise in gun homicides over the 1985 to 1993 period, and the subsequent decline. The first explanation is that the rise in gun possession increased the lethality of confrontations among young people. The subsequent decline in homicides would similarly be directly attributable to the reduction in gun possession described in the previous section. This first explanation ascribes a causal role for guns. The second explanation focuses instead on teens' inclination or motivations toward violence. The suggestion here is that there was an increase, after the mid-1980s, in violent tendencies of teens, followed by a lessening in violent inclinations (and that guns were only the tool being used to express this violence).¹⁵

The data in Charts 8 and 9 appear to be more consistent with the first explanation. If the latter explanation were the predominant influence, i.e., if 1985 marked an increase in teen's inclination toward violence, we might expect to have observed an increase in both gun and non-gun homicide. In fact, non-gun homicide victimization among African American teens remained roughly constant through the 1980s and 1990s. The evidence is thus consistent with a prominent role of guns, suggesting that initiatives which successfully reduce the prevalence of guns among teens will also reduce mortality due to homicide.

Turning from the focus on African American youth, to the state-level analysis of gun deaths for all children, provides additional insight into the role of guns in homicide of children. Guns play a minor role in the heinous crime of child murder. Of the 7,497 children under age 5 were murdered between 1988 and 1997, only about 1 in 10 were killed with a gun.¹⁶ Thus, while *gun* homicides of young children are more common in states with higher levels of gun possession (as indicated by the Adult Gun Index), the *overall* homicide rate of young children is only slightly higher in the high-gun states. Furthermore, the *non-gun* homicide rate is similarly higher in the high-gun states. (See Table 3.) Together, these statistics suggest that gun access does not play a large role in the homicide of our nation's youngest victims.

Guns appear to play a larger role in the homicide of 5- to 14-year-olds. For young children, both the *gun* homicide rate and *overall* homicide rate are positively correlated with the

¹⁵ See Blumstein and Cork, *op cit.*, for a discussion and further evidence.

¹⁶ The percent of homicide victims killed with a gun increases from close to 0 percent for children less than 1 year old to around 75 percent for older teenagers. (See: <http://www.ojp.usdoj.gov/bjs/homicide/weapons.htm>.) Perpetrators of homicide of young children are most commonly parents. (See <http://www.ojp.usdoj.gov/bjs/pub/pdf/htius.pdf>.)

Adult Gun Index.¹⁷ As indicated in Table 3, rates of *non-gun* homicide are similar in high-gun states to those in low-gun states. However, *gun* homicides are twice as high in the high-gun states. As a consequence the *overall* homicide rate of 5- to 14-year-olds is considerably higher in the high-gun states.

Table 3. Homicide Among Children and Youth, 1988-1997

	Rates of Homicide (per 100,000 in Age Group)		Ratio of Rates in High-Gun to Low- Gun States
	10 States with Highest Gun Possession	10 States with Lowest Gun Possession	
Children Aged 0-4			
Gun Homicides	0.48	0.20	2.4
Non-Gun Homicides	3.57	2.97	1.2
All Homicides	4.05	3.17	1.3
Children Aged 5-14			
Gun Homicides	1.05	0.52	2.0
Non-Gun Homicides	0.53	0.47	1.1
All Homicides	1.58	0.99	1.6
Youth Aged 15-19			
Gun Homicides	13.70	10.39	1.3
Non-Gun Homicides	2.44	2.61	0.9
All Homicides	16.13	13.00	1.2

Understanding the role of guns in the homicides of young people requires an analysis that focuses on the dynamics of gun carrying and violent interaction of young people. As discussed above, there is strong evidence to suggest that the proliferation of guns has had a major role in homicide deaths of the group of teens at highest risk of homicide victimization, African Americans.

6. CONCLUDING REMARKS

The United States has an enormous private stock of firearms. A study of firearm ownership in 14 industrialized nations found that the rate of gun ownership in the US is over 3 times as high as the rates of other countries averaged, and handgun ownership rates are 7 times as high as elsewhere.¹⁸ About one-third of the population owns guns, and there is approximately one firearm for every person in the United States. The relatively high rates of gun ownership extend to houses with young children. Approximately 35 percent of children under 17—about 22 million children—live in houses with guns.¹⁹ Twelve million of these children live in houses

¹⁷ The correlation coefficients between the Adult Gun Index and homicide rates are 0.64 for gun homicides of 0- to 4-year-olds, 0.33 for all homicides of 0- to 4-year-olds. The coefficient for gun homicides is significant at the 0.01 level; the coefficient for non-gun homicides of 0- to 4-year-olds is *not* significant at the 0.01 level (consistent with our observations above that guns do not have a large role in homicides of the youngest children). Correlation coefficients are 0.44 for gun homicides of 5- to 14-year-olds, and 0.40 for all homicides of 5- to 14-year-olds. Both coefficients are significant at the 0.01 level.

¹⁸ Data from Clarke, Stevens H., "Firearms and Violence: Interpreting the Connection," Popular Government, Winter 2000, and Killias, Martin, "International correlations between gun ownership and rates of homicide and suicide," Canadian Medical Association Journal, 1993.

¹⁹ Mark A. Schuster, et al., "Firearm Storage Patterns in US Homes With Children," *American Journal of Public Health*, April 2000.

with handguns. Moreover, more than 8 million children live in houses with firearms stored unlocked, and 2.6 million children live in houses where guns are stored in a manner most accessible to children: unlocked and loaded or unlocked and unloaded with ammunition nearby.

As documented in this report, the widespread presence of accessible guns presents a grave risk to American youth. In the decade between 1988 and 1997, 49,831 children aged 19 and younger died from gunshot injuries. Guns are involved in two of the three leading categories of youth mortality—homicide and suicide (as guns are used in 85 percent of teen homicides and 63 percent of teen suicides).

Research of the sort presented in this report is greatly hampered by the lack of good data. Despite the fact that firearm injury is the second leading cause of death in the United States, mortality data on gun deaths is exceedingly sparse. For example, mortality data do not indicate whether a handgun or long gun was used in a firearm fatality.²⁰ The current data system is not structured to gather information on the circumstances of firearm deaths. Moreover, there is no system in place to track the number of persons injured by firearms, estimated at over 60,000 people per year. This dearth of information on gun injury stands in contrast to the existing national system that tracks motor vehicle fatalities, the Fatality Analysis Reporting System (FARS), a system which permits evaluation of safety interventions (such as child restraint laws). Many have credited the FARS system with helping reduce the number of motor vehicle fatalities. Modest funding for a similar system on firearm injuries would help inform policy and thereby help reduce the costs of gun violence in the United States.

A large number of initiatives have been proposed or implemented designed to reduce youth access to firearms—including gun buyback programs, restrictions on handgun purchases, and trigger lock laws. The research presented in this report highlights the necessity of finding a long-term policy strategy that reduces youth gun access.

²⁰ Data from the FBI's supplementary homicide reports do indicate that 80 percent of gun homicides were committed with a handgun in 1998 (<http://www.ojp.usdoj.gov/bjs/homicide/weapons.txt>).

APPENDIX. THE ADULT GUN INDEX

The Adult Gun Index was calculated as a modified Cook's index.²¹ Cook's index is the unweighted average of the proportion of homicides and suicides committed with a gun in each state. The Adult Gun Index calculates this average for homicide and suicide victims age 20 and over from 1988-1997. Notice that this Index does not include young victims. Therefore there is no reason why the Index would automatically be correlated with the measures of gun-related mortality for youth studied in this paper. Also, it is important to note that the Adult Gun Index is related to the *fraction* of adult violent events (homicides and suicides) that involve guns, not the *number* of violent events. Thus a relatively high index does not mean that a state generally has more violent events—just that a greater proportion of those events involve guns. The table below lists the Adult Gun Index for each state.

State	Adult Gun Index	State	Adult Gun Index
Hawaii	.37	Michigan	.63
Massachusetts	.40	Montana	.63
New Jersey	.43	Maryland	.63
Rhode Island	.44	Florida	.64
South Dakota	.48	Oklahoma	.64
Delaware	.48	Vermont	.65
Minnesota	.52	Nevada	.65
New York	.53	Kansas	.65
New Hampshire	.54	Indiana	.67
Iowa	.54	Arizona	.67
Connecticut	.56	Idaho	.67
Illinois	.56	Missouri	.68
North Dakota	.56	South Carolina	.69
Colorado	.57	Texas	.69
Washington	.58	Virginia	.69
Maine	.58	Wyoming	.69
Wisconsin	.58	North Carolina	.70
Utah	.58	Georgia	.71
New Mexico	.59	Tennessee	.72
Pennsylvania	.60	Kentucky	.72
Oregon	.60	Arkansas	.72
Nebraska	.60	West Virginia	.73
California	.62	Mississippi	.74
Alaska	.62	Alabama	.74
Ohio	.62	Louisiana	.75

²¹ See Cook op. cit.