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### Abstract

**Objectives-** To describe the participants in a gun amnesty program and the firearms they exchanged, to compare gun owners participating in such a program with gun owners nationwide, and to assess any reduction in the prevalence of risk factors for firearm violence among participants in the program.

**Design and Setting-** A mail survey conducted between February and April, 1994, of participants in Sacramento, California gun amnesty program in August, 1993. Of 50 survey questions, 19 came from 5 national public opinion polls of gun owners.

**Participants-** 127 people participated in the amnesty program; 11 declined to give any identifying information at the time. Survey response rate was 79% (92/116) for participants to whom questionnaires could be sent.

**Results-** Nearly two-thirds (62%) of respondents were men, most (79%) were white, 40% were over 55 years of age, and no respondent was less than 25 years of age. Most respondents (80%) were gun owners at the time of the program, having turned in a gun they personally owned or still keeping a gun in their household after the program. Of 141 firearms exchanged, 72% were handguns. Almost half (46%) of respondents cited concern that children might gain access to the gun they exchanged as an important reason for participation. Few respondents turned in a gun because of a bad experience (12%) or from concern over a possible shooting in their home. Respondent gun owners were as likely as gun owners nationwide to have used a gun in self-defense or to have known someone shot in violent crime. Forty-one percent of respondents who owned a gun before the program no longer had any guns after the program, and the prevalence of handgun ownership declined from 79% to 32%.

**Conclusions-** The number of gun owners who no longer had any guns after the program and decline in handgun ownership suggest that the gun amnesty programs may play a significant role in reducing the prevalence of risk factors for firearm violence among participants and members of their households. To be optimally effective, future programs must include high risk youth.

## **Introduction**

In 1993, 5,146,469 firearms were manufactured in the United States, 55% of which were handguns (unpublished data, Bureau of Alcohol, Tobacco and Firearms, 1995), all of which add to the 160-200 million guns currently in circulation. Numerous national surveys have demonstrated that almost half of American households own at least one firearm, and more than half of these own at least one handgun, despite findings that the presence of a gun in the home is associated with a substantial increase in risk of fatal firearms violence.<sup>1 2 3</sup>

Also in 1993, an estimated 40,230 people in the United States died from firearm injuries: 4% accidents, 46% homicides and 49% suicides.<sup>4</sup> In 1990, the aggregate cost of such firearm injuries was an estimated \$20.4 billion, including \$1.4 billion in medical care, a bill most often paid with taxpayers' dollars.<sup>5</sup> Recent evidence suggests that firearms now surpass automobiles as the leading cause of traumatic death in the United States.<sup>6</sup>

In response, the Brady Violence Prevention Act, mandatory sentencing laws such as California's "Three Strikes" law, larger prisons, and innumerable community action programs all attempt to reduce the growing amount of firearm violence in the United States.

Attempting to reduce firearm violence at the local level, communities across the country have supported gun buy-back or amnesty programs in which anyone can exchange a gun for anything from cash to concert tickets. Together these programs have removed thousands of firearms from circulation.

Little is known, however, about the individuals who participate in these programs, what motivates them to do so, or how to compare with the gun owners nationally. Furthermore, no assessment changes in participants' risk of firearm violence has been made.

Between February and April 1994, we conducted a survey of participants in a Sacramento, California gun amnesty program that took place in August, 1993. Our objectives were to describe the participants as well as the guns they exchanged, to compare respondent gun owners with gun owners nationwide, to assess any reduction in prevalence of risk factors for firearm violence among participants in the program, and to identify any implications for future programs.

## **Methods**

During the last week of August 1993, the Sacramento Police Department conducted a gun amnesty program in which participants received vouchers for Sacramento Kings basketball tickets in exchange for unwanted firearms. The program was widely promoted in the local print and broadcast media. Participants were instructed

to put the firearm in a bag or box in the trunk of their car and bring the firearm to one of five locations. Police accepted the firearm and recorded a brief description of the gun and accompanying accessories. Name, address, and date of birth information were also recorded with the participants' consent. Serial numbers of relinquished firearms were checked; stolen firearms were returned to their rightful owners. No background checks or criminal investigations of participants were conducted.

One hundred and twenty-seven people participated in this program. Eleven did not give the police any identifying information, leaving 116 possible respondents to our survey. No independent information was available for the 11 persons to whom questionnaires could not be sent for the non-respondents to our survey.

We designed a questionnaire and conducted the survey following a method proven to be successful in varied populations.<sup>7,8</sup> Implementation of the survey required four mailings and took nearly two months to complete.

Participant identifying information and descriptions of the weapons exchanged, including type and caliber, were obtained from police records filled out at the time of the program. Weapons types included handguns (pistols, revolvers) long guns (rifles, shotguns) and airguns. Handguns were further divided into small (.22, .25 & .32 in.), medium (.38 & .380 in., 9 mm) and large (.357 & .45 in.). An identification number linked questionnaires with police records.

The questionnaire contained 50 questions and covered: (1) the administration of the program itself, (2) reasons for turning in a gun, (3) experience with guns, (4) the guns exchanged, (5) current gun ownership, (6) storage of guns, and (7) demographics. Of these 50 questions, 19 came from 5 national public opinion polls of gun owners: Gallup Organization, Gallup Poll, March 1991; Yankelovich Clancy Shulman for Time, Cable News Network, 1989; Gallup Organization, Gallup Poll, May 1991; National Opinion Research Center, General Social Survey, 1991; Gallup Organization, Gallup Poll, November, 1991. Questions taken from these polls were obtained by a computerized search of public opinion survey data from the Roper Center for Public Opinion Research at the University of Connecticut. Questions were chosen based on content, style, and population. These questions allowed us to compare gun owners who responded to our survey with the gun owners nationwide.

Odds ratios were calculated using Confidence Interval Analysis software, and exact tests were calculated using EpiInfo software with  $\alpha = .05$  chosen as the level of statistical significance.

## **Results**

Of 116 people for whom name and address information were available, 92 returned a questionnaire for a 79% response rate. Almost two-thirds (62%) of respondents were male. Most (79%) reported their race/ethnicity as white, not of Hispanic origin. Forty percent of the respondents were over 55 years of age, and none

were under 25 years of age. One-third of respondents earned more than \$50,000 a year, while very few (11%) earned less than \$20,000. At the time of the program, 73% of respondents had another adult over 25 years of age living in their household, 23% had a child under 14 years of age, 11% had a young adult 15 to 24 years of age, and 2% had children in both age groups.

Eighty percent of respondents were gun owners at the time of the program. These respondent gun owners differed from gun owners nationwide in age and income, with fewer gun owners under 34 years of age, fewer earning less than \$20,000 a year, and more earning over \$50,000.

Respondent gun owners reported more similarities than differences with gun owners nationwide in their experience with guns. Respondent gun owners were less likely than gun owners nationwide to have grown up with guns or to have had any formal training with guns. Respondent and nationwide gun owners were equally likely to have used a gun in defense of self, family, or possessions and to have known someone shot in violent crime. In addition, 32% of respondent gun owners knew someone who had used a gun to commit or attempt to commit suicide.

Survey respondents were offered 6 reasons why one might decide to turn in a gun and were asked if each was “important” or “not important” in their decision. Almost half of all respondents (46%) cited concern that children might get and use the guns as an important reason for participation. Few respondents reported a bad experience with a gun or concern of shooting in their home as important reasons in their decision to turn in a gun. Eighteen percent of respondents did not choose any of the 6 reasons at all.

According to police records, of 141 firearms exchanged, 40 (28%) were long guns and 101 (72%) were handguns, including 66 revolvers and 35 pistols. Of these handguns, 63% were of small caliber, 26% were of medium caliber, 8% were of large caliber, and 3% were of unknown caliber. In addition to the firearms exchanged, participants brought in 10 airguns and 3 tasers, as well as holsters, carrying cases, and boxes of ammunition. Eighty-seven percent of participants turned in one firearm, 8% turned in 2 or more firearms, and %% turned in only airguns. Almost one-fourth (23%) of respondents indicated the gun was not in working order, and another 24% were not sure.

Seventy-two percent of respondents reported turning in a handgun. Three-fourths (76%) of respondents turned in a gun that they owned or share ownership of, or that belonged to someone else in their household. Most respondents (85%) had the gun in their household for more than one year.

Of 71 respondents who were gun owners at the time of the program, 41% no longer had any guns afterwards. The percentage of gun owners with more than one gun declined from 62% to 35%. Furthermore, handgun ownership among gun owners was reduced from 79% to 32% as a result from participation in the program.

Forty-three respondents retained at least one gun in their household after participating in the program. Of these, 23 (53%) still kept a handgun and 30 (70%) still kept a long gun. These continuing gun owners were just as likely as gun owners nationwide to keep a gun loaded, to store some of all of their guns unlocked, and to carry a gun on their person or in their car or truck. Continuing gun owners, however, were only about half as likely as gun owners nationwide (OR=.55) to retain more than one gun in their household.

## **Discussion**

In recent years gun buy-back or amnesty programs have grown in popularity as a means for people to reduce the number of firearms in their households and communities. With the cooperation of police departments, the business community, local officials, and interested citizens, these programs have removed thousands of unwanted firearms from households across the country. Previous research has documented strong public support for such efforts.<sup>9</sup> However, while gun amnesty programs have enjoyed political popularity, much skepticism still surrounds their real effect. Because these programs are implemented at the community level, their short-term effectiveness in reducing rates of firearms violence may not be measurable in such small populations.

Our findings suggest real reduction risk of firearm violence for participants and their households, in that prevalence of recognized risk factors has been reduced. Forty-one percent of gun owners no longer had guns after the program, and handgun ownership declined by well over one-half. Numerous studies have shown that the presence of a gun in the home is associated with a substantial risk of fatal firearm violence. With the reduction in prevalence of gun ownership, especially handgun ownership, participants after the program are at less risk of firearm violence than they were before the program.

The actual reduction in risk of firearm violence among participants, however, may be mitigated by several factors. First, while many participants no longer had any guns after the program, those who still have guns use them as other gun owners do, often keeping a gun loaded and unlocked, concealed on their person or in their vehicle; these behaviors are associated with a higher risk of firearm injury. Second, given the high percentage of women and persons over 55 years of age, our study population may have been at lower initial risk of firearm violence compared with gun owners generally. Third, the group at highest risk of firearm violence, persons 15 to 24 years of age, were virtually absent from the program—2 of the 35 participants for whom we did not have any identifying may have fallen within this age group (personal communication, Kozuma A, 1994). Finally, many of the guns exchanged were not in working order and thus posed little potential for violence in the first place.

There are several limitations to this study. We did not have any information on the 11 participants to whom questionnaires could not be sent, nor the 24 participants who did not return a questionnaire. Since this was a relatively small survey of one city's gun amnesty program, it may not be appropriate to generalize our results to other cities or amnesty programs. Most importantly, it is difficult to estimate the effect of this program

on Sacramento's death, injury or crime rate, given the relatively small number of such events.

Implications of this survey suggest future gun amnesty programs should focus on children and young adults. Almost half of respondents identified concern that children might gain access to the gun they exchanged as one reason for participating in the program. Efforts should be made to continue to enable persons with similar concerns to safely dispose of unwanted firearms. Furthermore, education on the safe storage and handling of firearms should be made available. Only 2 of the 127 people who turned in a gun may have been under 25 years of age. Our data cannot determine if this was due to the type of incentive offered, the involvement of the police department, the perceived need to keep a gun, or ineffective advertising. For gun amnesty programs to be optimally effective, further efforts must work to include high risk youth.

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**Table 1- Demographic Characteristics**

	<i>Survey Respondents</i>		<i>Nationwide Gun Owners*</i>
	All Respondents (n=92)	Gun Owners (n=74)	
<b><i>Gender</i></b>			
Male	57 (62%)	51 (69%)	454 (75%)
Female	33 (26)	22 (30%)	151 (25%)
Unreported	2 (2%)	1 (1%)	--
<b><i>Age</i></b>			
15-34	14 (15%)	12 (16%)	230 (38%)
35-54	39 (42%)	33 (45%)	169 (28%)
55 +	37 (40%)	28 (38%)	206 (34%)
Unreported	2 (2%)	1 (1%)	--
<b><i>Race/ethnicity</i></b>			
White	73 (79%)	59 (80%)	532 (88%)
Black	5 (5%)	4 (5%)	36 (6%)
Hispanic	6 (7%)	5 (7%)	--
Other/unreported	8 (9%)	6 (8%)	36 (6%)
<b><i>Income</i></b>			
< \$20,000	10 (11%)	9 (12%)	121 (20%)
\$20,000 - \$49,999	45 (49%)	38 (51%)	278 (46%)
\$50,000 +	30 (33%)	22 (30%)	91 (15%)
Unreported	7 (8%)	5 (7A%)	115 (19%)

Percentages may not add up to 100 due to rounding.

\* 1989 Yankelovich Clancy Shulman, national public opinion survey of gun owners (n=605)

**Table 2- Gun owners' experience with guns**

	<i>Respondent Gun Owners (n=74)</i>	<i>Nationwide Gun Owners</i>	<i>OR (95% CI)</i>
<i>Parents had gun in the house</i>	41 (55%)	478 (79%)	.33 (.20-.54)
<i>Formal training with guns</i>	41 (55%)	478 (79%)	.33 (.20-.54)
<i>Used gun in defense of self, family</i>	6 (8%)	17 (8%)	1.0 (.31-2.8)
<i>Knew someone shot in crime</i>	18 (24%)	133 (22%)	1.1 (.65-2.0)
<i>Knew someone shot in accident</i>	19 (26%)	248 (41%)	.50 (.29-.86)

**Table 3- Gun ownership before and after the program**

	<i>Survey Gun Owners (n=71)</i>		<i>Differences in Proportions (95% CI)</i>
	Before Program	After Program	
No Guns	N.A.	209 (41%)	--
1 Gun	27 (38%)	17 (24%)	.14 (-.01-.29)
>1 Gun	44 (62%)	25 (35%)	.27 (.11-.43)
Handgun	56 (79%)	23 (32%)	.47 (.32-.61)

**Table 4- Gun ownership and storage by gun owners after the program**

	<i>Continuing Gun Owners</i>	<i>Nationwide Gun Owners</i>	<i>OR (95% CI)</i>
1 Gun	17 (40%)	102 (22%)	2.3 (1.2-4.5)
> 1 Gun	25 (58%)	334 (72%)	.55 (.29-1.0)
Handgun	23 (53%)	226 (47%)	1.3 (.69-2.4)
Gun loaded in house	12 (28%)	188 (31%)	.86 (.43 – 1.7)
Gun not locked up	25 (58%)	321 (53%)	1.2 (.66-2.3)
Carry handgun on person	7 (30%)	48 (23%)	1.5 (.57-3.8)
Carry handgun in vehicle	10 (43%)	82 (39%)	1.2 (.5 –2.9)

**Reasons for Turning in Gun**

Concerned children would get and used gun	46%
Afraid of the gun	30%
Concerned gun might be used against self	24%
Didn't know how to use gun	16%
Bad experience with gun	12%
Believed there would be shooting at home	10%

<sup>1</sup> Kellerman AL, et al. Gun Ownership as a risk factor for homicide in the home. *N Engl J Med* 1993; 329: 1084-91.

<sup>2</sup> Kellerman AL, Reay DT. Protection or peril? An analysis of firearm related deaths in the home. *N Engl J Med* 1986; 314:1557-60.

<sup>3</sup> Brent DA, et. al. The presence and accessibility of firearms in the homes of adolescent suicides. *JAMA* 1991; 266:2989-2995.

<sup>4</sup> National Center for Health Statistics. Annual summary of births, marriages, divorces and deaths: United States, 1993. Monthly Vital Statistics Report 1994 October 11; 42 (13) Hyattsville, MD. DHHS publication no. (PHS) 95-2230-4-1958.

<sup>5</sup> Max W, Rice DP. Shooting in the dark: estimating the cost of firearm injuries. *Health Aff (Millbank)* 1993; 12(4):171-185.

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<sup>6</sup> Wintemute GJ, Trauma in transition: trends in deaths from firearm and motor vehicle injuries. Sacramento, CA: Violence Prevention Research Program, 1995.

<sup>7</sup> Dillman DA. Mail and Telephone Surveys. New York, NY: John Wiley & Sons Inc; 1978.

<sup>8</sup> Dillman DA. Mail and other self-administered questionnaires. In: Rossi DH, Wright JD, Anderson AM, eds. Handbook of Survey Research. New York, NY: Academic Press Inc; 1983: 359-377.

<sup>9</sup> Callahan CM, Rivara FP, Koepsell TD. Money for Guns: Evaluation of the Seattle gun buy-back program. Public Health Reports 1994; 109: 472-477.