Public opinion about guns in the home

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Abstract

Objectives—(1) Determine the frequency of gun ownership, acquisition, and transfer; (2) assess gun storage practices; and (3) compare the views of firearm owning and non-owning adults regarding the protective value of keeping a gun in the home. **Setting and methods**—Over three different time periods (1995, 1996, and 1999) stratified, random digit telephone surveys were conducted in a five county area of metropolitan Atlanta, Georgia. Five hundred adults (aged 21+ years) responded to each survey.

Results—The proportion of Atlanta area households reporting firearm ownership was generally stable over this interval (38%, 40%, and 35% respectively). The percentage of gun owning households containing a handgun (approximately 75%) was stable as well. In 1995, more than half of gun owning households kept one or more guns unlocked; since that time, the trend has been gradually downward. In 1995, 44% of gun owning respondents kept one or more guns loaded, compared with 38% in 1996 and 40% in 1999. A majority of respondents to all three surveys (55%) agreed with the statement “A home with a gun is less secure than a home without a gun, because a gun can be involved in an accidental shooting, suicide or family homicide”. Among five home security measures, respondents rated a burglar alarm most effective, and keeping a gun in the home least effective.

Conclusions—In Atlanta, many households keep a firearm for protection, but they are ambivalent about the associated risks. These findings suggest that education about gun safety should include a discussion of the risks of unsafe storage, and non-lethal alternatives for home security. (*Injury Prevention* 2000;6:189–194)

Keywords: firearms; education; counseling; survey

Firearms are the second leading cause of fatal injury in the US.¹ In *Healthy People 2000*, a list of the public health objectives for the US, the US Public Health Service included the following goal: “Reduce by 20 percent the proportion of people who possess weapons that are *“inappropriately stored and therefore dangerously available”* (emphasis added).² Several medical groups as well as other organizations endorse the concept of public education to promote safe storage of firearms.^{3–6} Legal pressure on gun manufacturers has led some of them to voluntarily include trigger locks with their products.⁷

In 1994, five metropolitan Atlanta counties joined Project PACT (“Pulling America’s Communities Together”) an ongoing federal violence prevention initiative intended to encourage local governments and federal agencies to work together to identify local problems and create local solutions. These counties are Fulton, DeKalb, Cobb, Clayton, and Gwinnett. Through Metro Atlanta Project PACT, local leaders and community stakeholders were brought together and asked to identify the most pressing violence problems in the project area. Firearm violence (particularly firearm violence involving young people) was identified as a top priority for the city.

To assist Metro Atlanta Project PACT’s efforts to reduce gun violence, we obtained a grant from the National Institute of Justice to collect a wide range of baseline and interval data in the project area. This information was provided to the officials and groups responsible for reducing gun violence so they could monitor the impact of their strategies and make any changes that are necessary. Since the primary goal of this program was to reduce gun violence by juveniles and adult criminal offenders, interventions have been focused on blocking illegal sources of supply, illegal gun carrying, and illegal use of firearms. No effort has been made to discourage the lawful purchase and legal ownership of firearms.

Part of the evaluation of this initiative involved conducting a series of household surveys of gun ownership in the five county area. Survey objectives included the following: (1) assess and monitor the proportion of households that own, acquire, and/or transfer firearms over time; (2) determine the proportion that keep one or more firearms loaded or unlocked; and (3) determine if gun owning and non-gun owning households differ with respect to their perceptions of the benefits and risks of keeping a gun for protection.

Methods

TIMELINE

The first of three surveys was conducted from 2–18 May 1995. The second was conducted 18 months later, from 7–20 November 1996. The third was conducted two years later, from 18–22 January 1999.

SURVEY

All three surveys utilized random digit dialing to contact a stratified sample of 500 adults in the survey area. One hundred citizens in each of the five study counties were interviewed. Screening questions were asked to determine that the respondent was aged 21 years or older, and a member of the contacted household. Once these facts were established, our inter-

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viewers asked questions about household ownership, acquisition, storage, and disposition of firearms, as well as the respondent's rating of the effectiveness of a variety of home security measures. Participants were advised they could refuse to answer any question, and that they were free to terminate the interview at any time. The survey was approved by the Human Investigations Committee of Emory University.

DATA ANALYSIS

Responses were weighted on the basis of the population of each county to generate accurate aggregate estimates for the five county metro Atlanta area. Frequencies and cross tabulations were performed for each question based on demographic variables (age, race, sex, and level of education). Group comparisons were calculated using the χ^2 test, Yates' corrected χ^2 and Fisher's exact (for small cell size) for categorical variables, and the Mann-Whitney U test for ordinal values. For most responses, the statistical margin of error at the 95% confidence level was plus or minus four percentage points. The threshold for statistical significance was set at $p < 0.05$.

Results

DESCRIPTION OF THE POPULATION

Slightly less than two thirds of respondents to the 1995 survey were female. Sixty one per cent were white, and 34% were African-American. The mean age of respondents was 41 years, and 32% were college graduates. Two thirds of respondents owned their own home; the remaining one third rented. Thirty six per cent had one or more children aged 12 years or younger living in their home. The demographic breakdown of respondents in 1996 and 1999 resembled that of the 1995 group. With the exception of gender (60% of our respondents were female), the three groups closely resemble the demographic breakdown of adults in the study area (table 1). Among those who reported that guns are kept in their home, 29% (three year average) stated they had one or more children aged 12 years of age or younger living in the home; 15% (three year average) reported they had one or more teenagers aged 13–18 years living in the home, and 50% (three year average) had at least one child 18 years or younger living in the home.

FIREARM OWNERSHIP

Thirty eight per cent of respondents to the 1995 survey reported that one or more firearms are kept in their home. Seventy six per cent of firearm owning households had one or more handguns. In the 1996 survey, 41% of respondents reported a gun was kept in their household, and 72% of gun owning households had one or more handguns. In the 1999 survey, 35% of respondents reported that a gun was kept in their household and 69% of these gun owning households reported a handgun was kept in the home. None of these year-to-year differences are statistically significant. In all three surveys, white respondents were more

Table 1 Demographic characteristics of the study population ($n=500$ respondents in each year); values are %

	1995	1996	1999
Gender			
Male	37	39.3	39.8
Female	63	60.7	60.2
Racial/ethnic group			
African-American	34	33.6	30.4
White	61	59.2	59.8
Hispanic	1.6	1.6	2.8
Other minority group	1.6	3.1	4.7
Refused/missing	1.8	2.5	2.3
Age			
21–29	20.9	21.1	16.0
30–39	32.3	26.3	27.1
40–49	23.5	22.6	24.6
50–59	9.7	16.7	17.0
60–69	6.5	7.2	9.4
70 or older	5.8	5.8	5.5
Refused/missing	1.3	0.3	0.5
Education			
Grade 8 or less	1.9	2.0	1.1
Grade 9–11	1.9	4.6	2.3
High school graduate	19.0	19.5	21.0
1–3 years of college	23.7	22.4	13.7
Trade/technical school	7.1	5.2	5.8
College graduate	32.4	33.1	41.9
Graduate school	12.9	13.0	13.8
Refused/missing	1.2	0.2	0.3
Home ownership			
Own	66.1	67.8	70.3
Rent	32.6	31.5	27.8
Refused/missing	1.3	0.7	1.9
Children in residence			
% With children ≤ 12 years	35.9	32.4	29.2
% With children 13–18 years	18.9	15.1	17.7

likely than black respondents to keep a gun in their home (44% *v* 28%, three year average, $p=0.000$), but black gun owners were more likely to keep a handgun than whites (85% *v* 67%, three year average, $p=0.0002$).

FIREARM ACQUISITION, TRANSFER, AND DISPOSAL

In each year, gun owning respondents were much more likely to report acquiring a firearm than disposing of one. An average of 22% (24% in 1995, 19% in 1996, 22% in 1999) of gun owning households in each survey year reported buying a firearm within the past year. Not more than 7% of respondents reported selling, loaning, or giving away one or more firearms in the previous year in any of the three surveys. Less than 1% of gun owning respondents in any survey reported disposing of a firearm in the previous year through a gun "buy-back" program.

FIREARM STORAGE PRACTICES

Respondents in half of the gun owning households in the 1995 survey reported that they kept one or more guns in their home unlocked (table 2), and 44% kept at least one gun in their house loaded. Forty one per cent reported that they carried a gun in their car. In 1996, 47% of gun owning respondents kept one or more guns unlocked, 38% reported that a gun was kept loaded, and 40% reported that they carried a gun in their car. By 1999, the fraction of gun owning respondents who reported that they keep at least one gun unlocked had declined to 41% but the percentage of those who keep a gun loaded remained stable at 40%; 34% reported carrying a gun in their car. The decrease in persons leaving a gun unlocked between 1995 and 1998, and 1996 and 1998 is statistically significant ($p = 0.05$).

Table 2 Gun ownership, storage, and carrying: % answering "yes" within population subgroup (n=500 respondents in each year)

	1995	1996	1999
Gun ownership			
All	38.0	40.0	35.0
Male	47.7	47.4	42.8
Female	32.4	36.0	29.0
Black	24.2	34.5	24.3
White	46.0	45.2	41.2
Gun owners:			
Are any handguns?			
All	75.7	71.6	68.8
Male	77.1	73.6	79.0
Female	74.2	69.6	58.0
Black	86.8	80.7	86.8
White	72.1	66.1	62.6
Keep gun unlocked?			
All	52.5	46.8	41.4
Male	63.4	44.9	44.7
Female	43.2	48.0	37.5
Black	41.0	27.3	28.9
White	55.4	53.6	46.8
Keep gun loaded?			
All	44.4	38.8	39.7
Male	55.4	37.4	43.0
Female	35.1	39.6	36.4
Black	53.8	32.1	48.6
White	42.0	40.5	36.3
Kept or carried in an automobile?			
All	40.8	40.0	34.1
Male	44.0	46.7	39.5
Female	37.5	34.0	28.4
Black	48.7	41.1	35.1
White	38.6	37.8	33.9

Two subgroups within the population of gun owners may have altered their firearm storage practices over the course of the three surveys. The percentage of male gun owners who stated they keep a firearm loaded in their home decreased from 55% in 1995 to 37% in 1996 (χ^2 5.70, $p=0.0170$). In 1999, 43% of male gun owners kept a loaded firearm, this difference was not statistically significant from 1995 or 1996. The percentage who reported keeping a gun in their home unlocked also decreased, from 63% in 1995 to 45% in 1996 (χ^2 = 5.86, $p=0.0155$). This proportion remained stable in 1999 (χ^2 for 1995 *v* 1999, p = 0.015).

The percentage of African-American gun owners who reported that they keep a loaded firearm in their home declined from 54% in 1995 to 32% in 1996, to 49% in 1999. This trend was significant for 1995–96 (χ^2 = 4.47, $p=0.0344$) but not for 1996–99. African-American male gun owners in our group of respondents were also less likely to report keeping a gun unlocked (Yates' corrected χ^2 = 8.63, $p=.0033$; Fisher's exact $p=0.0015$) or loaded (Yates' corrected χ^2 = 4.58, $p=0.0324$; Fisher's exact $p=0.0157$) in 1996 than in 1995. No further decline was noted between the 1996 and the 1999 surveys.

REASONS FOR GUN OWNERSHIP

All three surveys asked gun owning respondents to identify the single most important reason that one or more guns were kept in their home. A majority of respondents to all three surveys (56% in 1995, 55% in 1996, and 53% in 1999) cited protection. Other important reasons for gun ownership included hunting or target practice (three survey average 23%); inherited the gun (three survey average 8%); collector's item (three survey average 6%); and occupational use (three survey average 4%).

None of these responses varied by more than two percentage points in one survey compared with another.

African-Americans were more likely than whites to cite protection as their primary reason for gun ownership (three survey average 71% *v* 48%, $p=0.0000$). White respondents, on the other hand, were more likely to cite hunting (three survey average 27% *v* 11%, $p=0.0002$).

PERCEIVED BALANCE OF BENEFITS AND RISKS OF KEEPING A GUN IN THE HOME

To ascertain respondents' views of the balance of benefits and risks of keeping a gun in the home, they were read three statements about the balance of benefits and risks of keeping a gun in the house and asked to rate their level of agreement with each statement on an 11 point scale (0 = strongly disagree to 10 = strongly agree).

For purposes of analysis, responses to each statement were aggregated into three groups: 0–3 = strongly disagree, 4–6 = somewhat agree/disagree, and 7–10 = strongly agree. In each survey year, a plurality of respondents (44.1%) strongly disagreed with the statement "A home with a gun is more secure than a home without a gun, because a gun can be used for protection". Clear majorities in each year (55%) strongly agreed with the second statement "A home with a gun is less secure than a home without a gun, because a gun can be involved in an accidental shooting, suicide, or family homicide" compared with 20% (three year average) that strongly disagreed. A larger plurality disagreed (three year average 43.8%) than agreed (three year average 30.7%) with the final statement "On balance, a home with a gun is safer than the same home without a gun". Responses were generally consistent across all three surveys, reflecting little shift in public opinion (table 3).

Not surprisingly, gun owners rated the protective value of keeping a gun in the home more favorably than non-gun owners. Owners also expressed less concern about the associated risks of keeping a gun in the home. An average of 45% (47% of gun owners in 1995, 46% in 1996 and 43% in 1999) "strongly agreed" with the statement "On balance, a home with a gun is safer than the same home without a gun." In contrast, only 20% of non-gun owners (21% in 1995, 18% in 1996, and 22% in 1999) strongly agreed with this statement. These differences were highly significant (p = 0.001 level) during every year of the survey (table 3).

EFFECTIVENESS OF HOME SECURITY MEASURES

In the first two editions of the survey, respondents were asked to rate the effectiveness of five home security measures on an 11 point scale ranging from zero ("not at all effective") to 10 ("very effective"). "Installing a burglar alarm system" was rated most effective of the five options (mean scores 7.76 in 1995, and 7.90 in 1996). "Having a gun in the home" was rated least effective in 1995 and 1996 (mean scores 4.46 and 4.41, $p<0.001$).

Table 3 Perceptions of the benefits and risks of keeping a gun for protection*

	All respondents			Gun owners	Non-gun owners	Gun owners	Non-gun owners	Gun owners	Non-gun owners
	1995	1996	1999	1995	1995	1996	1996	1999	1999
"A home with a gun is more secure than a home without a gun because a gun can be used for protection"†	4.59 n=494	4.48 n=495	4.10 n=503	6.44 n=177	3.35 n=288	6.18 n=194	3.20 n=285	5.78 n=174	3.03 n=307
% Who "strongly agree"	33.3% n=492	34.0% n=497	27.2% n=503	54.8% n=177	19.1% n=288	54.6% n=194	18.6% n=285	43.6% n=172	16.9% n=307
"A home with a gun is less secure than a home without a gun, because a gun can be involved in an accidental shooting, suicide, or family homicide"†	6.61 n=491	6.53 n=496	6.43 n=503	4.95 n=174	7.73 n=288	5.38 n=192	7.40 n=286	5.59 n=174	7.06 n=307
% Who "strongly agree"	55.7% n=492	56.5% n=494	52.6% n=503	35.6% n=174	70.1% n=288	37.5% n=192	70.5% n=285	39.3% n=173	62.0% n=308
"On balance, a home with a gun is safer than the same home without a gun"†	4.41 n=484	4.37 n=495	4.31 n=503	5.94 n=176	3.26 n=286	5.93 n=191	3.19 n=284	5.44 n=174	3.57 n=307
% Who "strongly agree"	31.3% n=489	30.2% n=496	30.2% n=503	47.4% n=175	20.6% n=287	46.1% n=191	18.4% n=283	42.6% n=176	21.8% n=307

*Mean, or "average", scores are calculated based on responses to a 0–10 scale, where a score of "0" indicates the most negative possible reaction ("strongly disagreed"), and a score of "10" indicates the most positive possible reaction ("strongly agreed"). The higher the score, the more strongly the respondent agreed with the statement.

For purposes of analysis, a score of 0–3 was interpreted as "strongly disagreed", a score of 7–10 was interpreted as "strongly agreed" and a score of 4, 5, or 6 was interpreted as "neither agreed nor disagreed".

†Differences between group means (gun owners *v* non-gun owners) significant at $p < 0.001$, calculated using Mann-Whitney U test. Differences were significant between groups for each question, during every year of the survey.

1995: 29 cases missing data regarding whether or not there was a gun in the household on date of survey.

1996: 20 cases missing data regarding whether or not there was a gun in the household on date of survey.

1999: 20 cases refused question, two cases replied "don't know" regarding whether or not there was a gun in the household on the date of the survey.

"Installing bright exterior lights", "having a dog in the home", and "installing metal security doors" received mean scores of between 6.28 and 7.50 in either year (7.41, 6.69, and 6.28 respectively in 1995, and mean scores of 7.50, 6.77, and 6.28 in 1996) (table 4).

As expected, gun owners consistently rated the effectiveness of "having a gun in the home" more favorably than non-gun owners (mean scores 6.52 *v* 3.11, Mann-Whitney U $p < 0.001$ in 1995; mean score 6.27 *v* 2.98, Mann-Whitney U $p < 0.001$ in 1996). Despite this fact, gun owning respondents rated having a gun in the home less effective than installing a burglar alarm system, bright exterior lights or having a dog in the home. Non-gun owners rated having a gun in the home last among the five options in both the 1995 and 1996 surveys (table 4).

Discussion

The rate of gun ownership reported by respondents to our surveys is lower than the national average, but fairly typical of urban residents.^{8–9} Although it is possible that some

respondents gave false negative replies to the questions about ownership of a firearm, we consider this unlikely. To encourage accurate replies, questions about gun ownership were preceded by the permissive statement "Half of all homes contain one or more firearms; are guns of any kind kept in your home?" We did not ask respondents if any of the guns were unregistered or illegally owned. Respondents were informed that they could refuse to answer any question or terminate the interview at any time. Previous research has demonstrated that respondent answers to survey questions about gun ownership are generally valid.^{10–11}

A majority of gun owning respondents cited protection as their most important reason for keeping a gun. Not surprisingly, they also viewed the protective benefits of gun ownership more favorably than non-gun owners. However, a growing body of research suggests that keeping a loaded and readily available gun in the home does more harm than good.^{12–20}

Our findings suggest many gun owning households may be ambivalent about their

Table 4 Perceptions of the value of five home security measures*

	All respondents			Gun owners	Non-gun owners	Gun owners	Non-gun owners	Gun owners	Non-gun owners
	1995	1996	1999	1995	1995	1996	1996	1999	1999
Having a gun in the home†	4.46 n=493	4.41 n=495	‡	6.52 n=179	3.11 n=285	6.27 n=193	2.98 n=284	‡	‡
Installing bright exterior lights	7.41 n=497	7.50 n=500	‡	7.33 n=180	7.41 n=288	7.60 n=195	7.38 n=286	‡	‡
Installing metal security doors	6.28 n=484	6.28 n=492	‡	6.09 n=175	6.37 n=282	5.98 n=190	6.42 n=283	‡	‡
Having a dog in the home	6.69 n=494	6.77 n=498	‡	6.83 n=180	6.59 n=286	6.92 n=195	6.68 n=285	‡	‡
Installing a burglar alarm system	7.76 n=494	7.90 n=497	‡	7.69 n=180	7.79 n=287	7.68 n=192	8.05 n=285	‡	‡

*Mean, or "average", scores are calculated based on responses to a 0–10 scale, where a score of "0" indicates the most negative possible reaction ("not at all effective"), and a score of "10" indicates the most positive possible reaction ("very effective"). The higher the score, the more favorable the rating.

†Differences between group means (gun owners *v* non-gun owners) significant at $p < 0.001$, calculated using Mann-Whitney U test.

‡Did not repeat these questions in the 1999 administration of the survey.

1995: 29 cases missing data regarding whether or not there was a gun in the household on date of survey.

1996: 20 cases missing data regarding whether or not there was a gun in the household on date of survey.

Table 5 Perceptions of the benefits and risks of keeping a gun for protection* men versus women, stratified by gun ownership (between group significance)

	All respondents			Gun owners	Non-gun owners	Gun owners	Non-gun owners	Gun owners	Non-gun owners
	1995	1996	1999	1995	1995	1996	1996	1999	1999
"A home with a gun is more secure than a home without a gun because a gun can be used for protection"	(0.002)	(0.002)	(0.000)	(0.078)	(0.659)	(0.143)	(0.060)	(0.001)	(0.000)
Men	5.18 n=184	5.16 n=197	5.34 n=200	7.05 n=83	3.27 n=90	6.63 n=91	3.66 n=101	6.90 n=86	3.94 n=106
%Who "strongly agree"	40.2% n=184	41.1% n=197	38.5% n=200	63.4% n=82	17.7% n=90	61.1% n=90	23.3% n=103	56.5% n=85	23.4% n=107
Women	4.23 n=310	4.04 n=300	3.27 n=303	5.89 n=93	3.39 n=198	5.79 n=103	2.95 n=184	4.68 n=88	2.55 n=202
%Who "strongly agree"	29% n=310	29% n=300	19.8% n=303	47.3% n=93	19.7% n=198	51.0% n=102	17.2% n=186	31.8% n=88	13.9% n=202
"A home with a gun is less secure than a home without a gun, because a gun can be involved in an accidental shooting, suicide, or family homicide"	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.093)	(0.006)	(0.000)	(0.000)
Men	5.34 n=182	5.76 n=196	5.25 n=200	3.73 n=81	6.82 n=90	4.79 n=90	6.80 n=101	4.50 n=86	6.17 n=106
%Who "strongly agree"	39% n=182	45.9% n=196	35.5% n=200	19.7% n=81	56.2% n=89	29.7% n=91	62.7% n=102	25.9% n=85	45.7% n=105
Women	7.36 n=309	7.04 n=300	7.20 n=303	6.02 n=93	8.14 n=198	5.90 n=102	7.73 n=185	6.65 n=88	7.53 n=202
%Who "strongly agree"	66% n=309	62.6% n=300	63.6% n=303	48.4% n=93	76.3% n=198	44.6% n=101	74.6% n=185	53.4% n=88	70.9% n=203
"On balance, a home with a gun is safer than the same home without a gun"	(0.001)	(0.050)	(0.000)	(0.007)	(0.909)	(0.233)	(0.392)	(0.000)	(0.002)
Men	5.02 n=182	4.88 n=193	5.60 n=200	6.77 n=83	3.19 n=90	6.12 n=89	3.60 n=99	6.70 n=86	4.48 n=106
%Who "strongly agree"	39% n=182	37.3% n=193	43.5% n=200	57.8% n=83	18.4% n=87	51.1% n=90	22.0% n=100	57.6% n=85	29.8% n=104
Women	4.05 n=307	4.04 n=302	3.46 n=303	5.20 n=92	3.29 n=199	5.76 n=102	2.96 n=185	4.22 n=88	3.10 n=202
%Who "strongly agree"	27% n=307	25.8% n=302	21.8% n=303	38.7% n=93	21.3% n=197	41.2% n=102	16.1% n=186	30.3% n=89	17.8% n=202

*Mean, or "average", scores are calculated based on responses to a 0–10 scale, where a score of "0" indicates the most negative possible reaction ("strongly disagreed"), and a score of "10" indicates the most positive possible reaction ("strongly agreed"). The higher the score, the more strongly the respondent agreed with the statement.

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decision to keep a gun in the home. Over the three surveys, an average of 37% of gun owning respondents "strongly agreed" with the statement, "A home with a gun is less secure than a home without a gun, because a gun can be involved in an accidental shooting, suicide or family homicide". A minority of gun owners (three year average 45%) "strongly agreed" with the statement, "On balance, a home with a gun is safer than the same home without a gun". The remaining 55% of gun owners were either neutral or disagreed with this statement. Non-gun owners were much more skeptical of the perceived the balance of benefits and risks associated with keeping a gun in the home.

There seems to be a basic incongruence between practices and the beliefs of many adults who keep a firearm in their home. Although a majority of gun owners identified "protection" as their most important reason for keeping a gun in the house, most recognized that there are also dangers associated with doing so. It is interesting to note that the majority of respondents in gun owning as well as non-gun owning households considered several non-lethal home security measures to be more effective than keeping a gun in the home. We are unaware of any empirical data that supports or refutes this belief.

Our findings are limited in certain respects. They are based on three small (n=500) surveys of adults living in a single metropolitan area and therefore may not be generalizable to other

cities in the US. However, a larger telephone survey of a nationally representative sample of 4138 registered voters in urban areas of the US yielded results that are similar to our own. In that survey, 29% of respondents reported that they believed keeping a gun in the home makes the home more safe, 40% believed it made the home less safe, 23% said it depends, and 9% were not sure.²¹

Sixty per cent of our respondents were women; most gun owners are men.⁹ Ludwig and colleagues have noted that wives tend to report household ownership of firearms less often than husbands.²² In all three of our surveys, women tended to view the merits of keeping a gun in the home less favorably than men (table 5). Others have made the same observation.²¹ If this is true, the preponderance of women respondents may bias our surveys in a direction that is less favorable to gun ownership.

Health providers interested in reducing the risk of firearms injuries in the home may find it easier to promote "safe storage" of guns than to counsel gun owning patients to remove firearms from their home.³ The National Rifle Association's *A Parent's Guide to Gun Safety* advises owners to "Always keep the gun unloaded until ready to use" and "store guns so that they are inaccessible to children and other unauthorized users".²³ The Sporting Arms and Ammunition Manufacturers Institute supports the notion that the safe handling of firearms

requires that guns be stored unloaded in a locked area separate from the ammunition.^{4 24}

The *Clinician's Handbook of Preventive Services* includes the following recommendations: (1) never keep a loaded gun in the home; (2) keep guns and ammunition locked in separate locations; (3) always treat a gun as if it were loaded; and (4) never allow children access to guns.²⁵

The American Medical Association has produced a guidebook for physicians that emphasizes the importance of safe storage.²⁶

Although no study has conclusively demonstrated that storing guns in a secure manner reduces the subsequent risk of injury, there is indirect evidence that safe storage of firearms is beneficial. Safe storage could reduce the risk that firearms will be lost due to burglary or theft, an event that occurs more than 350 000 times each year in the US.²⁷ Safe storage may also decrease the likelihood that a loaded gun will be reached by a child²⁸ or used to commit suicide.¹⁴

Implications for prevention

Firearm injuries are a major cause of premature death and disability nationwide.^{29 30} In metropolitan Atlanta, most gun owning households contain a handgun. Many households keep at least one gun unlocked or loaded. Our findings suggest that a majority of these gun owning households are ambivalent about the balance of benefits and risks associated with keeping a gun in the home. Perhaps in response to these concerns, the number of gun owning households that report unsafe storage practices has declined somewhat in recent years. Health educators and health care providers should view this development as an encouraging trend and redouble their efforts to educate patients about the importance of safe storage^{13 26 31} and the availability of non-lethal alternatives for home security.

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- 1 Mercy JA, Ikeda R, Powell K. Firearm-related injury surveillance: an overview of progress and the challenges ahead. *Am J Prev Med* 1998;15(3S):6-16.
- 2 Department of Health and Human Services. *Healthy people 2000: national health promotion and disease prevention objectives*. Washington, DC: US Department of Health and Human Services, Public Health Service, 1990. (DHHS Publication No (PHS) 91-50212.)
- 3 Cassel CK, Nelson EA, Smith TW, et al. Internists' and surgeons' attitudes toward guns and firearm injury prevention. *Ann Intern Med* 1998;128:224-30.

- 4 Hemenway D, Solnick SJ, Azrael DR. Firearm training and storage. *JAMA* 1995;273:46-50.
- 5 American Academy of Pediatrics and Center to Prevent Handgun Violence. *STOP: steps to prevent firearm injury*. 2nd Ed. Elk Grove Village, IL: AAP, 1996.
- 6 American College of Physicians. Firearm injury prevention (position paper). *Ann Intern Med* 1998;128:236-41.
- 7 Ottoway DB. A boon to sales, or a threat? Safety devices split industry. *Washington Post* 20 May 1999: A1-8.
- 8 Weil DS, Hemenway D. Loaded guns in the home: analysis of a national random survey of gun owners. *JAMA* 1992;267:3033-7.
- 9 Cook PJ, Ludwig J. *Guns in America: results of a comprehensive national survey on firearms ownership and use*. Washington, DC: Police Foundation, 1996.
- 10 Kellermann AL, Rivara FP, Banton J, et al. Validating survey responses to questions about gun ownership among owners of registered firearms. *Am J Epidemiol* 1990;131:1080-4.
- 11 Wright JD, Ross P, Daly K, et al. *Weapons, crime and violence in America: a literature review and research agenda*. Washington, DC: United States Government Printing Office, 1981: 79.
- 12 Kellermann AL, Lee RK, Mercy JA, et al. The epidemiologic basis for the prevention of firearm injuries. *Annu Rev Public Health* 1991;12:17-40.
- 13 Kellermann AL. Comment: gunsmoke—changing public attitudes towards smoking and firearms. *Am J Public Health* 1997;87:910-13.
- 14 Kellermann AL, Rivara FP, Somes G, et al. Suicide in the home in relation to gun ownership. *N Engl J Med* 1992;327:467-72.
- 15 Brent DA, Perper JA, Goldstein CE, et al. Risk factors for adolescent suicide: a comparison of adolescent suicide victims with suicidal inpatients. *Arch Gen Psychiatry* 1988;45: 581-8.
- 16 Brent DA, Perper JA, Allman CJ, et al. The presence and accessibility of firearms in the homes of adolescent suicides. *JAMA* 1991;266:2989-95.
- 17 Kellermann AL, Rivara FP, Rushforth N, et al. Gun ownership as a risk factor for homicide in the home. *N Engl J Med* 1993;329:1084-91.
- 18 Kellermann AL, Reay DT. Protection or peril? An analysis of firearm-related deaths in the home. *N Engl J Med* 1986; 314:1557-60.
- 19 Lee RK, Harris MJ. Unintentional firearm injuries: the price of protection. *Am J Prev Med* 1993;9(suppl):16-20.
- 20 Kellermann AL, Somes G, Rivara FP, et al. Injuries and deaths due to firearms in the home. *J Trauma* 1998;45:263-7.
- 21 Howard KA, Webster DW, Vernick JS. Beliefs about the risks of guns in the home: analysis of a national survey. *Inj Prev* 1999;5:284-9.
- 22 Ludwig J, Cook PJ, Smith TW. The gender gap in reporting household gun ownership. *Am J Public Health* (in press).
- 23 National Rifle Association. *Parents' guide to gun safety*. Fairfax, VA: NRA, 1995.
- 24 Sporting Arms and Ammunition Manufacturer's Association, Inc. *Firearms safety depends on you*. Riverside, CT: Sporting Arms and Ammunition Manufacturer's Association, 1987.
- 25 Department of Health and Human Services. *Clinician's handbook of preventive services: put prevention into practice*. Washington, DC: US Department of Health and Human Services, Public Health Service, Office of Disease Prevention and Health Promotion, 1994: 195-293.
- 26 American Medical Association. *Physician firearm safety guide*. Chicago, IL: AMA, 1998.
- 27 Rand MR. *Guns and crime: handgun victimization, firearm self-defense and firearm theft*. Washington, DC: US Department of Justice, April 1994. (Crime data brief NCJ-147003.)
- 28 Wintemute GJ, Teret SP, Kraus JF, et al. When children shoot children: 88 unintended deaths in California. *JAMA* 1987;257:3107-9.
- 29 National Research Council. *Injury in America*. Washington, DC: National Academic Press, 1985.
- 30 Rice DP, MacKenzie EJ, and Associates. *Cost of injury in the United States: a report to Congress*. San Francisco, CA: Institute for Health and Aging, University of California and Injury Prevention Center, Johns Hopkins University, 1989.
- 31 Price JH, Everett SA, Bedell AW, et al. Reduction of firearm-related violence through firearm safety counseling: the role of family physicians. *Arch Fam Med* 1997;6:79-83.