The US gun stock: results from the 2004 national firearms survey

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The US gun stock: results from the 2004 national firearms survey

The General Social Survey, a biannual survey of the US civilian population, has tracked household and personal firearm ownership over the past two and a half decades.¹

This survey reports the percentage of households with firearms and personal firearm ownership for the nation as a whole and for the nine major census regions. Over the past 4 years, information from the General Social Survey has been supplemented by information on household gun ownership at the state level from the National Behavioral Risk Factor Surveillance System.² A clear pattern that has emerged over the past several decades from these surveys is a persistent decline in household gun ownership. Although these surveys describe the demographic patterns of gun ownership in the US, they provide almost no information about the characteristics of or changes in the nation’s gun stock.

We conducted a nationally representative household telephone survey in 2004 to explore the characteristics of privately owned firearms in the US. The last study to examine detailed questions like these, such as the types and numbers of working firearms in private homes, was conducted in 1994 by Cook and Ludwig.³ In their comprehensive report, they found that 35% of households and 25% of individuals owned firearms, and estimated that there were 192 million working firearms in the US in private hands. In addition to describing demographic characteristics of firearm owners, they were able to determine that the ownership of private firearms was highly concentrated among a small percentage of owners. They also clearly identified a difference in the number of household firearms reported by married men and women, who, in theory, should report similar rates of household firearm ownership. Their findings, however, that married men reported a rate of 49% household firearm ownership compared with 36% reported by married women suggested that women were either unaware of their spouse’s firearm ownership or were reluctant to report it. These results led the authors to believe that more complete survey responses would come from individuals who personally owned a firearm rather than the household responses.

All of these findings helped identify patterns of private firearm ownership in the US and provided health professionals, researchers and policy makers with information about the private gun stock that was previously unknown. Through our survey, we wished to investigate possible changes in the privately owned gun stock between 1994 and 2004 and provide additional information about firearm ownership patterns in the US.

METHODS

The institutional review board at the Harvard School of Public Health approved this study in 2004. The random-digit-dial telephone sample (conducted by the survey research firm Fact Finders, St Louis, Missouri, USA) comprised 2770 randomly selected adults aged ≥18 years living in the 50 states and including the District of Columbia. The number of interviews designated for each of the states was proportional to that state’s population relative to the total population of the US as given by the 2000 census. The methods used in composing this sample assured that each household with a telephone had an equal probability of being selected for inclusion in the sampling frame. One adult from each household was randomly selected to participate.

Interviews were completed between 17 March and 28 June 2004. Once a telephone number had been randomly selected for inclusion in the survey sample, as many as 10 repeat phone calls were made until a final disposition was assigned. Of the 31 302 telephone numbers called, 13 117 (42%) were nonresponses, 11 065 (35%) were not eligible and eligibility was unknown for 4338 (14%). In total, 41% of the numbers were not residential, not in service or were for households in states where the interview quota had been reached. In addition, 39% of interviews could not be completed because the maximum number of calls had been made without an eligible respondent answering the phone. Only 19% (5421) of the non-interviews were refusals. According to calculations based on formulas from the American Association for Public Opinion Research,⁴

www.injuryprevention.com
our minimum response rate was 14%, assuming that all
unknowns were eligible and counting partial interviews as
respondents; and our maximum response rate was 18%,
assuming that all unknowns were ineligible.

Demographic characteristics including age, sex, education,
marital status, race, presence of children in the home, whether
the area was urban or rural, and household size of our sample
were compared with those from the 2000 census. Although the
demographic characteristics of our sample seemed similar
overall to that of the census, our respondents had slightly
higher educational levels (92% v total US 85% had at least a
high-school diploma) and single-family households were fewer
(19% v total US 26%). Our sample also under-represented adult
men aged 18–34 years. For that reason, post-stratification
weightings were applied to the data to reflect the age and sex
distribution of the US population. Adjustments for the like-
lihood of selection on the basis of the number of adults in the
household were also included in the weightings.

Our study included 40 active duty military personnel, who
represented 1.4% of the total study population. Eleven reported
owning firearms; however, only one reported owning the
firearm primarily for work. We therefore chose to keep all of the
respondents in the sample.

Respondents were asked several questions regarding firearm
ownership and use. In particular, they were asked, “Do you or
anyone you live with currently have any guns in your home or
motor vehicles? Not including toys, models, air guns or starter
pistols.” If the response was affirmative, the respondent was
then asked, “In total, how many guns do you and anyone you
live with currently have in your home or motor vehicle?” All
respondents who replied that there were guns in their house-
hold were asked how many of each type of firearm was in their
home (ie, revolvers, shotguns) and if they were in working
order. To determine the proportion of adults who personally
owned firearms, we asked those respondents who had replied
that there were guns in their home, “Do any guns in your home
belong to you personally?”

Statistical analyses
Descriptive and bivariate analyses were used to explore the
relationships between firearm ownership, demographics, con-
centration and motivations for ownership. As previously
mentioned, research suggests that individuals who personally
own firearms report firearm ownership more accurately than
non-owners who live in households with firearms. All of our
reported analyses are therefore based on responses from
individual gun owners rather than respondents living in
households with guns, unless specifically noted that the
calculation was performed using household responses.

To produce national estimates of the number of firearms in
the US, we used population figures from the US census to
determine the number of adults aged ≥18 years and the
number of households in the US. We then calculated the
percentage of respondents in our survey who reported
personally owning a firearm. This number was applied to the
US population to create national estimates of the number of
adults who owned firearms. To estimate the number of firearms
in private hands, we multiplied the number of firearm owners
by the average number of firearms reported by respondents in
our survey. As firearm ownership is not normally distributed
and our survey included some extreme outliers in terms of the
number of firearms owned, we performed calculations exclud-
ing the outliers. As a sensitivity analysis, similar calculations
were performed using household reports of firearm ownership.
We also conducted comparative analyses among men and
women, and among respondents who lived alone and those
living in multi-person households.

RESULTS
Firearm owners reported that 60% of the firearms owned in the
US in 2004 were long guns, primarily rifles and shotguns (fig 1);
the remaining 40% were handguns. Among all firearms, rifles
were the most common, representing 33% of the gun stock.
Revolvers were the most common type of handgun. A small
percentage of respondents (5%) reported owning other hand-
guns, including derringers and antique handguns. Other long
guns, which include muzzle loaders and antique long guns,
represented 6%.

According to our survey, 38% of households reported at least
one firearm in the home and 26% of adults reported owning at
least one gun. This corresponds to 42 million households with
firearms and 37 million adult gun owners. We found that 64%
of gun owners or 16% of adults reported owning at least one
handgun; 80% of gun owners or 20% of all adults owned a long
gun (results not shown).

Ownership demographics
Firearm ownership was more prevalent among middle-aged
and older adults than among young adults aged 18–24 years
(table 1). Ownership of any firearm was more common among
men, those who were married or living with a partner, and
respondents living in rural areas or the South. Ownership was
strongly associated with whether the respondent grew up with
guns in the home. Among gun-owning households in our
survey, 46% had ≥1 adult gun owner.

Reasons for ownership
When respondents were asked, “What is the one most
important reason that you own a handgun/long gun?” the
most common response among those who owned a handgun
was for self-defense (46%), followed by sport shooting (hunting
or target shooting) or collecting (23%). Owners of long guns
overwhelmingly reported sport shooting as the “most impor-
tant” reason to own a long gun (77%; data not shown).

Concentration of ownership
Almost half (48%) of all individual gun owners, corresponding
to 13% of the US adult population, reported owning ≥4
firearms. Household ownership followed a similar pattern, with
41% of firearm-owning households reporting ownership of ≥4
firearms (table 2). The 20% of gun owners who owned the most
guns possessed about 65% of the nation’s guns.

![Figure 1](types_of_firearms owned in the US)
Number of guns

The actual number of guns reported in our survey varied depending on how the question was asked and who answered the question. Individual firearm owners (n = 702) reported owning an average of 6.6 (95% confidence interval (CI) 5.2 to 7.9, median 3) working firearms. On further examination, it seemed that individuals who owned >4 firearms (with an average of 12 firearms per person) were greatly affecting the mean. When outliers representing the top 3% of gun owners (those owning >25 guns) were removed, the average number of working firearms per owner was 5.0 (95% CI 4.6 to 5.4). On the basis of estimates of 26% of adults in the US owning at least one firearm, we estimated that 57 million adults owned 283 million firearms (95% CI 260 to 305 million).

Estimates based on the number of household firearms were lower. We estimated that 42 million households in the US possessed at least one firearm in 2004, with an average of 5.2 (95% CI 4.9 to 5.6) guns per household, with outliers of >25 guns removed. The number of privately owned firearms in the US based on these estimates would be 218 million (95% CI 206 to 235 million).

Reporting differences

Overall, men and women reported different rates of household firearm ownership. Among married respondents who lived in two-adult households, married men reported a household firearm ownership rate of 54% and an average of 8 firearms per household compared with a 40% ownership rate and an average of 4.6 guns as reported by married women (table 3).

DISCUSSION

In general, our survey results are consistent with previous reports of firearm ownership demographics. Firearms are most likely to be owned by white men who live in a rural areas, those who are middle-aged or older, with a middle to higher income, who grew up with guns in the home and who live in the southern or mid-western regions of the country. Long guns continue to be the most prevalent type of gun in the US. Our survey, however, reports a slightly higher percentage of firearms that are handguns than that reported in 1994 (40% vs 34%). This shift to a greater proportion of handguns may be reflective of the decline in hunting and indicate a change in motivations and use of firearm ownership.

Table 1 Demographic characteristics of firearm owners

<table>
<thead>
<tr>
<th></th>
<th>Owns any firearm, n = 726 (%)</th>
<th>Owns both handguns and long guns, n = 322 (%)</th>
<th>Owns handguns only, n = 127 (%)</th>
<th>Owns long guns only, n = 215 (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>2770</td>
<td>26</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25</td>
<td>216</td>
<td>16</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>25–44</td>
<td>903</td>
<td>26</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>45–64</td>
<td>1058</td>
<td>30</td>
<td>15</td>
<td>5</td>
</tr>
<tr>
<td>≥65</td>
<td>545</td>
<td>27</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1363</td>
<td>42</td>
<td>20</td>
<td>5</td>
</tr>
<tr>
<td>Female</td>
<td>1407</td>
<td>11</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>2178</td>
<td>30</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>Non-white</td>
<td>592</td>
<td>15</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>953</td>
<td>18</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Married or living with partner</td>
<td>1786</td>
<td>30</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Community</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>687</td>
<td>18</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Suburban</td>
<td>1161</td>
<td>23</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Rural</td>
<td>872</td>
<td>37</td>
<td>18</td>
<td>4</td>
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<tr>
<td>Education</td>
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</tr>
<tr>
<td>High school or less</td>
<td>920</td>
<td>26</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Some college/associated degree</td>
<td>930</td>
<td>29</td>
<td>12</td>
<td>6</td>
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<tr>
<td>Bachelors or higher</td>
<td>904</td>
<td>23</td>
<td>12</td>
<td>4</td>
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<tr>
<td>Annual income</td>
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<td></td>
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<td></td>
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<td>&lt;US$40000</td>
<td>1120</td>
<td>21</td>
<td>8</td>
<td>4</td>
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<tr>
<td>&gt;US$40000</td>
<td>1282</td>
<td>30</td>
<td>15</td>
<td>6</td>
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<td>Military service</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Veteran</td>
<td>404</td>
<td>53</td>
<td>27</td>
<td>8</td>
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<tr>
<td>Current military</td>
<td>40</td>
<td>31</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>2316</td>
<td>22</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Political views</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liberal</td>
<td>594</td>
<td>16</td>
<td>7</td>
<td>4</td>
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<tr>
<td>Moderate</td>
<td>861</td>
<td>26</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td>Conservative</td>
<td>1019</td>
<td>32</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>Region</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast</td>
<td>530</td>
<td>17</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Midwest</td>
<td>635</td>
<td>27</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>South</td>
<td>986</td>
<td>32</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>West</td>
<td>619</td>
<td>24</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Child aged &lt;18 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1016</td>
<td>27</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>No</td>
<td>1749</td>
<td>26</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Parents had a gun at home</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1647</td>
<td>40</td>
<td>18</td>
<td>6</td>
</tr>
<tr>
<td>No</td>
<td>1103</td>
<td>7</td>
<td>3</td>
<td>2</td>
</tr>
</tbody>
</table>
surveys, handgun owners were most likely to report owning their handguns for self-protection, whereas owners of long guns reported owning their guns for sporting purposes. Individuals who own only handguns are just as likely to live in an urban environment as a rural one and are demographically more diverse compared with owners of only long guns who are more likely to be men and live in a rural area.

Our findings diverge from those of previous studies on firearm ownership regarding the increase in the average number of guns per gun owner. Although the rate of individual (26%) and household (38%) ownership is similar to that in other recent surveys, the number of guns reported per person is higher. When including outliers, gun owners reported an average of 6.9 guns per owner compared with 4.1 reported in 1994 (J Ludwig, personal communication, 12 January 2005). The higher average number of guns in our survey is attributable to the higher number of guns owned by those who owned ≥4 guns, as the percentage of gun owners in each category of gun ownership (those owning 1–3 or ≥4 guns) has stayed almost the same.

Cook and Ludwig reported an estimate of 192 million working firearms in circulation in 1994. Although the population increased 11% between 1994 and 2004, population growth alone does not explain the differences in the number of guns reported. A recent report by the National Research Council, using national data on firearms manufactured, imported and exported, estimated that 258 million firearms were available in the US as of 1999. This estimate does not account for firearm loss, breakage or those destroyed. When we calculated the number of guns in the same manner as in the National Research Council report, adding all available years, we calculated that about 275 million guns were manufactured or imported for private sale in the US by the end of 2003. As the US does not require firearms to be registered (although some individual states do), it is impossible to determine the exact number of privately owned firearms in this country.

Our estimates of 283 million firearms in the US may be higher than those that Cook and Ludwig established in 1994, even with the population growth kept in context, for many possible reasons. Our sample may have, by chance, captured more affluent firearm owners who own many guns. We adjusted for age and sex, but were unable to adjust for income because our income-related questions were not comparable with a standard such as the US census. Alternatively, respondents may have overestimated the number of guns they owned. Given that we are extrapolating from a survey of 2770 respondents to millions of Americans, small changes in the number of reported firearms results in a large difference in the national estimates.

The General Social Survey indicates that household gun ownership has been declining over time, from about 50% in the early 1970s to current estimates of 34%. Although the exact number of firearms in the US may be debatable as a result of inclusion or exclusion of outliers, or whether individual or household responses are used, it seems that although the proportion of households with firearms is declining, the number of working firearms in the US is increasing, not decreasing, and increasing most among those who already own firearms.

We also found evidence to support earlier research showing that women report lower levels of household firearm ownership, and in particular report fewer guns per household than men. Married women in our study reported an average of 3.4 fewer household guns than married men and a difference in ownership of 14% (54% in men v 40% in women). These findings reinforce earlier recommendations for surveys of firearm ownership and behavior, to seek information from individual firearm owners rather than any person living in a household with a firearm.

**Limitations**

We have considered some of the challenges faced when conducting telephone surveys, in particular those related to asking household members to respond to questions about topics, in this case firearm ownership, which may pertain to other members of the household. This self-reported data may also be subject to potential inaccuracies due to recall bias or the tendency to report socially desirable responses. For example, when we asked respondents two different questions to determine how many firearms were in their households, one asking for the total number of guns in the home and one asking specifically how many of each type of gun were owned, we often received two different numbers. Given that this was a telephone survey, we were limited to adults with access to a working telephone. If households without telephones were more or less likely to own a firearm, then our findings could be biased in the respective directions. Finally, non-response can

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**Table 2** Distribution of firearm ownership in the US population

<table>
<thead>
<tr>
<th>Firearms owned</th>
<th>Individuals</th>
<th>Households</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>≥4</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Any firearm</td>
<td>26†</td>
<td>39†</td>
</tr>
</tbody>
</table>

*Calculations based on the number of individuals who reported an actual number of firearms; 5% of households that reported owning a firearm did not report the number of firearms present in their home.
†These numbers are calculated using the affirmative response to owning a firearm.

**Table 3** Rates of household firearm ownership, median and average number of guns per household for men and women

<table>
<thead>
<tr>
<th>Ownership rate</th>
<th>Average number of guns</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td>49</td>
<td>7.9</td>
</tr>
<tr>
<td>Women</td>
<td>30</td>
<td>4.1</td>
</tr>
<tr>
<td>Married men</td>
<td>54</td>
<td>8.0</td>
</tr>
<tr>
<td>Married women</td>
<td>40</td>
<td>4.6</td>
</tr>
<tr>
<td>Men who live alone</td>
<td>39</td>
<td>6.8</td>
</tr>
<tr>
<td>Women who live alone</td>
<td>12</td>
<td>2.5</td>
</tr>
</tbody>
</table>

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**Key points**

- Firearm ownership in the US is very common, with about one third of all households owning at least one firearm.
- Long guns are the most prevalent type of gun in the US, but 40% of the gun stock is handguns.
- Firearm ownership is highly concentrated, with a small number of adults owning a large proportion of the nation’s firearms.
- Married men and women report different rates of household firearm ownership, supporting the proposal that researchers should seek information about firearm ownership from individual firearm owners.
The US gun stock

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